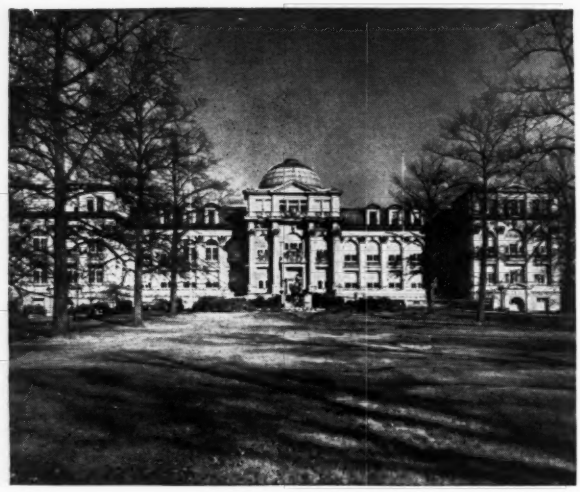
THE GARDEN JOURNAL

OF THE NEW YORK BOTANICAL GARDEN

Vol. 6, No. 4 July-August, 1956



THE GARDEN JOURNAL
of The New York Botanical Garden

DOROTHY EBEL HANSELL
Editor

CONTENTS
July-August, 1956

Old Tomes and Green Things Growing	*Betsy Copping Corner*	97
Lawn Verges	*T. H. Everett*	100
Roses in England Summer 1955. *Part II*	*Edwin De T. Bechtel*	102
The Production of Modern Roses	*George Ohlhus*	105
I Like to Arrange Dahlias	*Grace Swanson*	108
Growing Dahlias Under Cloth	*Jesse L. Strauss*	110
Hunting Oregon Iris	*Donald P. Rogers*	111
Nematodes and Scorch In Iris	*L. F. Randolph*	113
The Edge of the Arctic Tundra	*Walter W. Shannon*	114
The Ida Cason Callaway Gardens	*Fred C. Galle*	116
Know What to Do	*James M. Gibb*	119
Spring 1956 Garden Tour		122
Book Reviews		124
News, Notes and Comments		127
Let There Be Herbs	*Gertrude B. Foster*	132

CREDIT FOR ILLUSTRATIONS

We are indebted to the Special Display Committee—Mrs. Charles Burlingham, Mrs. Richard Meredith, Mrs. Donald B. Straus—for the selection of the front cover illustration. Photo of original plate from **Life among the Flowers** by Laura Greenwood, by E. N. Mitchell; pp. 97, 98, 99, photos of original plates by E. N. Mitchell; pp. 100, 101, T. H. Everett; pp. 102, 103, photos by Mrs. Edwin De T. Bechtel; p. 105, J. Horace McFarland; p. 106, Gordon S. Smith; p. 107, Sanborn Studio—all courtesy Conard-Pyle Co.; pp. 108, 109, 110, Grace Swanson; p. 112, Delbert Shirley; pp. 114, 115, Walter W. Shannon; pp. 116, 117, 118, Ida Cason Callaway Gardens; p. 122, Philadelphia Museum of Art; p. 123, upper left. J. F. Morsello, right, Philadelphia Museum of Art; pp. 127, 128, 129, E. N. Mitchell; p. 130, photo of certificate by E. N. Mitchell, lower right, courtesy Garden Club of New Jersey.

AMONG OUR CONTRIBUTORS

BETSY COPPING CORNER is currently engaged in editing a selection of Dr. John Fothergill's letters with the aid of a grant from The American Philosophical Society. A student of eighteenth-century history, she has published a book, *William Shippen, Pioneer in American Medical Education*, and is the author of several articles on other medical men, English and American, whose lives illustrate the influence of England on science and medicine in the colonies. During a recent period of residence in Oxford, England, Mrs. Corner visited the scenes of Dr. Fothergill's life and studied his manuscript materials in the Bodleian Library, the Linnean Society, Friends House, and elsewhere. She recently came from Baltimore to live in New York where her husband, Dr. George W. Corner, has joined the Rockefeller Institute . . . T. H. EVERETT is Curator of Education and Horticulturist of The New York Botanical Garden, in demand as lecturer, and author of *The American Gardener's Book of Bulbs, Lawns and Landscaping Handbook, How to Grow Beautiful House Plants, Flower Garden Guide*, and *Gardening Handbook*, and many articles on gardening . . . EDWIN DE T. BECHTEL, who is a member of the Board of Managers of The New York Botanical Garden, and of its executive committee, has over two hundred and fifty species and sub-species and varieties of roses in his garden at Bedford Four Corners, Mt. Kisco, New York. His description of "Roses in Western Europe: Summer 1955" is the leading article in the *American Rose Annual*, 1956. Mr. Bechtel, a consulting rosarian for the New York District of the American Rose Society, has been invited to talk on "Roses in Europe: 1955" at the American Rose Society meeting in St. Louis this fall . . . GEORGE OHLHUS is Secretary of The Conard-Pyle Company of West Grove, Pa., and the Superintendent of its rose production. In addition, he has done some hybridizing and introduced two roses, 'Anna Marie' and 'Pennsylvania.' Mr. Ohlhus has been with Conard-Pyle twenty-seven years, joining the firm shortly after coming to this country from Germany . . . GRACE (MRS. STANLEY G.) SWANSON was about twelve years old when she won her first ribbon in a flower show; since then she has won blue ribbons and tri-colors for her arrangements, trophies and medals for her dahlias, roses, gladiolus, and delphiniums. An accredited judge of the National Council of State Garden Clubs, Mrs. Swanson teaches flower arrangement by lecturing and demonstration and by conducting workshops. She is a member and has served in official capacity with Chicago Horticultural Society, Central States Dahlia Society, Smithtown Dahlia Club, Morgan Park (Chicago) Garden Club, Garden Club of Illinois, but "first of all, a plain dirt gardener with a love for every growing thing". . . JESSE L. STRAUSS, who has long been engaged in gardening in and around Chicago, is Chief Horticulturist of the Men's Garden Clubs of America . . . DR. DONALD P. ROGERS, Curator of The New York Botanical Garden, studies and writes about plant life, collects plants, and grows plants in the attractive garden surrounding his home in Scarsdale, N. Y.... The British Iris Society has awarded the Foster Memorial Plaque to DR. L. F. RANDOLPH, Professor of Botany at Cornell University since 1939. The award was made "in recognition of all-round qualities in an age when the expert has become a narrow specialist with no interest outside a very narrow segment of knowledge." Dr. Randolph has done and is doing "immense pioneering work on the scientific aspect of irises . . . a great grower and lover of plants . . . traveled the earth (in 1954 Dr. and Mrs. Randolph spent six months studying iris from Turkey and Cyprus westward through Europe) seeking out species in their native haunts . . ." WALTER W. SHANNON, naturalist and amateur photographer, has traveled near and far in pursuit of nature studies. He has held audiences spellbound at the Free Saturday Afternoon Lecture Programs at The New York Botanical Garden... FRED C. GALLE majored in ornamental horticulture at Ohio State University under the guidance of Dr. L. C. Chadwick and Professor Alex Laurie and was graduated in 1943. After an interruption in his horticultural career by thirty-four months service in the U. S. Army, he returned to Ohio State as research assistant and completed work for his M.S. Mr. Galle is listed in "Who's Who in the South and Southwest:" five years as assistant professor of horticulture at the University of Tennessee, where he completed course work toward his Ph.D. in botany and started a cytotaxonomic study of native azaleas, one year in a similar capacity at Ohio State, and three years Director of Horticulture at the Ida Cason Callaway Gardens . . . JAMES M. GIBB is Superintendent of "Chelmsford," the estate of the late Mrs. Elon Huntington Hooker at Greenwich, Conn. . . . GERTRUDE B. FOSTER is editor of "Herb Grower Magazine."

The Garden Journal of The New York Botanical Garden is published bimonthly by The New York Botanical Garden, Bronx Park, New York 58, N. Y. Printed in the U. S. A. Re-entered as Second Class Matter, February 1, 1951, at the Post Office at New York, N. Y., under the Act of August 24, 1912. Annual subscription, $2.00. Single copies 35 cents. Foreign countries and anywhere outside the continental United States, 50 cents a year extra.

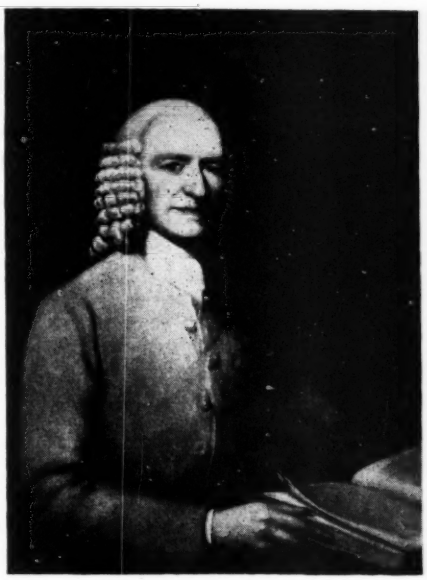
Old Tomes and Green Things Growing

A QUAKER DOCTOR'S TREASURES

By **Betsy Copping Corner**

ONE OF THE CHOICEST eighteenth-century English gardens was established in 1762 by Dr. John Fothergill, the well-known Quaker physician, who was said to have at that time the largest practice in London. Dr. Fothergill, who had grown up as a boy in lovely Wensleydale in Yorkshire, felt that a garden was absolutely essential for human well-being. At Upton in Essex, five miles from London streets, he acquired an estate of some thirty acres where fifteen gardeners kept his grounds in order. His correspondence with people in distant countries, his cultivation of acquaintance with sea captains, foreign visitors to England, and traveling botanists rewarded him with a collection of plants, shrubs, and trees which he called "exotics" for his garden. Seeds and plants, bulbs and roots were brought or sent to him from China, India, Africa, North and South America, Siberia, the Alps, and the isles of the sea. Queen Charlotte envied his possession of a tea tree imported from China which flowered in 1774 and grew to a height of seven and a half feet. In his villa at Upton he could open glass doors and pass directly into his greenhouses, then an unusual luxury for an amateur botanist, where orange trees blossomed and more than three thousand tropical plants were successfully growing. Young artists were engaged to visit the estate to draw his plants at every stage of development.

The main garden was divided into two almost equal parts by a winding canal — adding greatly to the charm of the landscape — in the form of a crescent. Rare exotic shrubs lined the walks



Dr. John Fothergill
from the painting by Gilbert Stuart.

following the watercourse. When Sir Joseph Banks, who had traveled widely as a naturalist and who became President of the Royal Society, visited the place he declared that no other garden in Europe had so many valuable plants assembled at an expense seldom borne by a private individual and with an ardor that characterized all of Dr. Fothergill's endeavors.

Writing to his friend Humphrey Marshall, the Pennsylvania botanist, Dr. Fothergill has given a pleasant description of a favorite part of his garden in which he felt Marshall had a share through making important contributions.

"Under the north wall I have a good border," he writes, "made up of that kind of rich turf-like soil mixed with some sand in which I find most part of the American plants thrive best. It has a few hours of morning and evening sun and is quite sheltered from mid-day heats. They are well-supplied with water in summer, and the little shrubs and herbaceous plants have a good warm covering of dry fern thrown over them when the frosts set in. This is gradually removed when the spring advances, so that by never being frozen in the ground while the plants are young and tender, I never lose any that come to me with any degree of life in them, and it is acknowledged by the ablest botanists we have that there is not a richer bit of ground in curious American plants in Great Britain. My garden is well-sheltered, the soil is good, and I endeavor to mend it as occasion requires. I have an Umbrella Tree about twenty feet high that flowers abundantly with me every spring. I have a little wilderness which when I bought the place was full of old yew trees, laurels, etc; I had it cleared, well dug and took up many trees but left others for shelter. Among these I have planted kalmias, azaleas, all the magnolias, and most other hardy American shrubs. It is not quite eight years since I made a beginning, so that my plants must be considered young ones. They are, however, extremely flourishing. The great Magnolia has not yet flowered with me but grows exceedingly fast. I shelter his top in winter; he gains from half a yard to two feet every summer; and will ere long, I doubt not, repay my care with his beauty and fragrance."

These flourishing contributions from

Rembert Dodoens

North America made him long for more. In another letter addressed to Marshall, he writes:

"There is a kind of dogwood whose calyx is its greatest beauty; it chiefly grows in Virginia, whether with you, I know not. I want a few plants of it... If they are taken up with a little earth and a good root, early in the spring, and the earth tied close about them with strong paper and packthread, or if they are put into boxes, with moss only about their roots, and sent away in the spring, they would come very safe. The boxes should not be nailed so close but that a little air may get in.

"Would it be possible to send one of those pretty little Owls alive? . . . Most Captains in the trade would take care of it, and a Mocking Bird, if they could be found, but it is best to keep these things alive with you [through the winter] and send them in the spring, if possible."

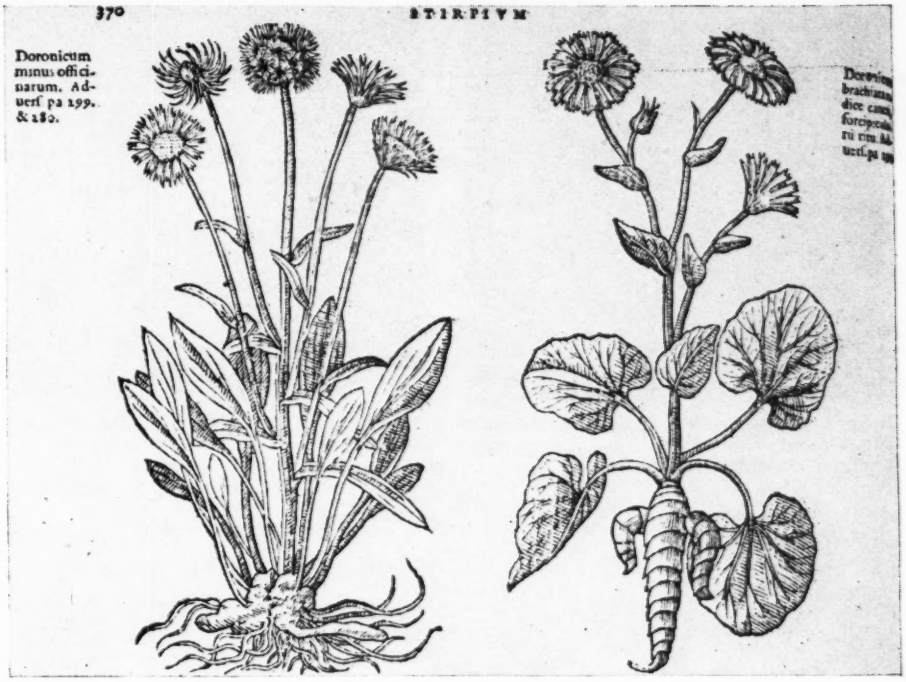
Kept in London during the winter by a demanding medical practice, Dr. Fothergill, a bachelor, was made very comfortable by his sister Ann who managed his household. The library-study of his house in Harpur Street, Red Lion Square, well stocked with volumes reflecting his varied interests, was particularly rich in botanical books. He had made a small systematic collection of more than two hundred books illustrating the evolution of botanical learning from Theophrastus, Pliny, and Dioscorides to Linnaeus in his own day. The discovery that plants were useful as healing agents had been made very early; the ancient herbalists were usually medical men; and as the universities developed, their professors of botany were invariably drawn from the ranks of the physicians. It is easy to understand why both from inclination and training Dr. Fothergill chose to collect botanical books as a hobby.

The ancient Greeks were represented in Dr. Fothergill's library in excellent Latin translations which became numerous in the sixteenth century, originating in Italy. Pietro Andrea Mattioli, a scholarly Italian physician, produced noteworthy commentaries on the works of Dioscorides which received more than fifty editions. Dr. Fothergill had the best of these, prepared by Gaspard Bauhin, professor of anatomy and botany at Basle. In Bauhin's family there had been an unbroken line of medical men for over two hundred years, and we shall hear again of his personal contributions to botanical science. There were no early botanical manuscripts in Dr. Fothergill's library nor any incunabula, the technical name for books printed before 1501. He had a few early English books of the sixteenth century, mostly curious survivals. He acquired most of the books which may be considered landmarks in the history of botany. As a doctor with strong scientific interests, he took pains to secure the books by the men who in the seventeenth and eighteenth centuries were classifying plants systematically. The works of Morison, Ray, Tournefort, and Linnaeus were all upon his shelves.

Dr. Fothergill seems to have enjoyed particularly collecting the fascinating productions of the great botanical travelers, who circulated all over the world in journeys planned partly and sometimes wholly to discover specimens of useful, beautiful, and unusual plants. Colonization by the Dutch in the East and West Indies, South America, India, and the Cape of Good Hope had been a great stimulus to botanists and their illustrators. Sir Hans Sloane's early voyage to Jamaica had produced a rich harvest of eight hundred hitherto unknown species of plants and was the direct source of inspiration which sent Plumier from France to the Caribbean. Volumes of the voyagers multiplied on Dr. Fothergill's shelves, books by such people as Englebert Kaempffer, chief surgeon of the Dutch fleet who visited Persia and Japan, Gmelin who pushed his way into Siberia, Rumphius in Amboyna in the East Indies, Aublet in French Guiana, Aubriet in the Levant.

John Fothergill, who stayed at home, traveled through the magic of these pages far from the sickbeds of his patients. Like winter-weary moderns, he could also solace himself by his fireside poring over catalogues of plants; with this difference, however, that the catalogues interesting him had been prepared by experts working in the great botanical gardens filled with the rare specimens they were listing. Such works sometimes came indeed from private gardens. Linnaeus before his great days of fame was employed by a wealthy patron Cliffort, a Haarlem banker, to record his collection of plants. Dillenius, the first Sherardian professor of botany at Oxford and director at the time of Oxford's Botanical Garden, also worked in the private garden of James Sherard, the retired apothecary in Eltham—listing his plants, drawing and etching them for *Hortus Elthamensis*. In Fothergill's library there were also excellent examples of the great flower books—*florilegia* with glowing pages of unfading bloom—and stacks of drawings, not all of them botanical, most of them

Commelina erecta, plate facing page 92, from *Hortus Elthamensis*



Upper half of page 370, illustrating *Doronicum* from *Stirpium Historia* by Matthiae De Lobel.

properly bound in morocco, such as these taken at random: one hundred drawings of flowers from the Cape; twelve months of flowers and fruits, with prints of birds; thirty-six Nuremberg drawings in water colors of plants and animals; drawings by Piranesi of buildings and views in Italy.

We cannot examine all the books in any library we visit, but let us consider a few of the important ones in Dr. Fothergill's collection.

He owned a second edition of the most highly considered of the earlier English herbals, *The Grete Herball, Imprynted by Peter Treveris* in London, 1529. Its quaint woodcuts add to the charm of a book which, in spite of its date, is thoroughly mediaeval in spirit, perpetuating superstitious and outworn traditions of dosage for disease. It warns amusingly against the dangers of taking baths and drinking cold water but is modern enough to recommend hair dyes and stains for the fingernails, suggests horehound for coughs, laudanum, opium and lettuce for narcotics, olive oil for burns, borax and rose water for the complexion, and, strangely, cuttle-fish bone for whitening the teeth.

To the same period belong Maplet's charmingly entitled *Greene Forest* of 1567; Fitzherbert's *Booke of Husbandrie,* 1531, the work of a famous lawyer and justice of the King's Bench; and *A Lytel Herball of the Properties of Herbes,* by Anthony Askham, Physycyon, published by Jhon Kynge, the date of which is debated. A copy of a book by Hieronymous Tragus, who was born plain Jerome Bock, with "comment" and colored figures, but without a date of place or publication given, turns out upon search to be probably a Latin translation of 1552, made from his original *Kreuter Büch* written in German, printed without illustration in Strassburg, 1539. Tragus is remembered specially as the discoverer that ferns have seed, as the country people had claimed without convincing earlier writers. Although Tragus did not dispute the superstition held by country folks that this seed can be gathered only on Midsummer's Eve, he boasted that he gathered it without the aid of "charmes, wytchecrafte and sorserys."

We must certainly inspect Turner's Herbal 1538, for this is the famous work of the "Father of British botany," a pioneer of the Renaissance who fought against superstition in science. He was educated for the church at Cambridge but had taken a medical degree somewhere in Italy when exiled because of his liberal religious views, for which he endured persecution all his life, although at last he became Dean at Wells where he had a beautiful garden.

With the work of Otto Brunfels, friend of Tragus, we come to a number of other important volumes in the Fothergill library. Brunfels' *Herbarum Vivae Eicones* first appeared in 1530 from the Strassburg press of Schottum. Dr. Fothergill had the second edition of two years later. This book is exactly what the title implies — Pictures of Living Flowers. Its pictures are more important than its text, which is largely compilation from earlier herbals. Illustrators had been copiers, too, borrowing constantly from older works, no matter how crude and stiff the woodcuts were. Hans Weidetz, who made the vigorous drawings Brunsfels used, drew exactly what he saw from actual specimens brought to him. If the plants were withered or battered by wind and rain, that is the way they look in his pictures. His work set a new standard of realistic naturalism for botanical illustrators. About twenty years ago some of his watercolors which were used to make the cuts for Brunsfels' book were found, produced with delicacy and skill and absolutely accurate in botanical detail; according to the experts — little masterpieces suggestive of Dürer.

In Antwerp during the second half of the sixteenth century a remarkable publisher, Christophe Plantin, was producing with distinction the work of three of his talented friends, all of them medically trained botanists — Rembert Dodoens, Charles de l'Ecluse, and Mathias de L'Obel whose name is kept alive by the well-known plant, *Lobelia.* Dodoens and L'Ecluse were such close friends that they exchanged information freely and even without the slightest jealousy interchanged woodblocks for the books they were preparing. Dr. Fothergill was fortunate enough to own Dodoens' collected works, *Stirpium historia pemptades sex,* 1583, as well as three books by L'Ecluse and one by L'Obel, all of them bearing the impress of the Plantin press in Antwerp. This press for more than three hundred years operated in the same family, and the house where it was installed has now become practically unchanged, the Musée Plantin — Moreau, a fitting memorial to men devoted to making beautiful books.

To be continued in the September-October issue.

If lawn verge is broken, with an edging tool cut parallel with it about nine inches back from turf margin.

To facilitate lifting sod, make end cuts beyond damaged area, from verge to cut parallel with it.

Slice under marked-out sod with spade or turf lifter and remove it cleanly, about two inches thick.

LAWN VERGES

Their Care and Repair

By T. H. Everett

Turn removed sod around and replace it with injured verge inside, newly cut edge forms a new verge.

With blade of spade tap sod into alignment with margin of lawn. Take care its surface is level.

Behind newly reversed sod fill irregular crevice with fine soil enriched with humus and fertilizer.

Maintenance of Neat Verges

Make added soil firm by pressing it with fingers or ramming it with a slender stick. Make surface level.

THE BEAUTY OF EVEN A GOOD LAWN is marred if its margins are not neat and trim. The maintenance of clean lines of demarcation between lawn areas and adjacent paths and flower beds is of prime importance in creating a well-cared-for appearance.

One of the commonest and, if well maintained, effective devices for emphasizing dividing lines between grass and neighbor areas is what the English call a verge. In this sense the word refers to a cleanly cut vertical wall of grass sod or turf that stands about two inches above the level of the path or bed and forms the lawn edge.

Scatter grass seed over the soil-filled crevices and work it into the surface with a broom or rake.

Verges look pretty but do need rather a lot of care to keep them in good condition. Each spring they should be cut to the exact lines they are to follow by using an edging tool, a device with a semi-circular or half-moon-shaped blade at the end of a longish handle. At intervals of two or three weeks from spring to fall verges should be trimmed to remove overhanging grass and prevent the ragged, don't-we-need-a-haircut appearance that untrimmed verges have. For these trimmings long-handled edging shears are satisfactory; they avoid the necessity for bending or stooping, as must be done if short-handled clippers or sheep shears are used.

Careful gardeners go to considerable effort to preserve good verges. Wheelbarrows, hand carts, lawn mowers and the like are not pushed or pulled over them unless a wooden ramp is first laid against them to prevent the edge of the turf being damaged.

Finally, pat sod and new soil firmly with back of spade or a tamper, then water well with fine spray.

Despite care, verges are sometimes broken down by a careless footstep, a wheelbarrow or cart handled by an unthinking operator or even by a mishandled automobile. When this happens prompt steps should be taken to effect repair. A simple procedure for doing this is illustrated in the accompanying photographs.

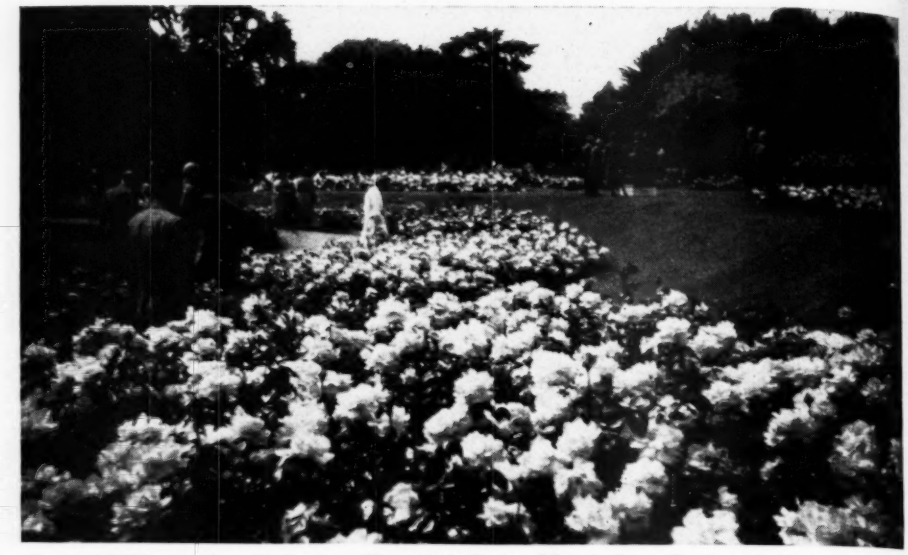
Briefly, the idea is to cut out a rectangle of sod containing the injured edge and then to reverse it so that the newly cut edge, which forms the opposite side of the sod rectangle to the damaged edge, becomes the new verge and the old, broken verge is located some distance inwards from the edge of the path or bed. The irregular crevice between the transposed sod and the remainder of the lawn is filled with fine soil which is pressed down, levelled, sown on its surface with grass seed and then made firm and watered.

ROSES IN ENGLAND

SUMMER 1955

By Edwin De T. Bechtel

Continued from the May-June number



A remarkable display of the rose 'Peace' in Queen Mary's Rose Garden in Regent's Park.

Roses from Hastings to the Chiltern Hills

On our rose circuit in western Europe, we had seen the hybrid teas, floribundas, new "park roses," and continuously blooming pillar roses of Kordes in Holstein and, in Denmark, Poulsen's hybrid polyanthas (as Svend Poulsen prefers to call them). When we returned to England, late in July, we saw many of the Kordes and Poulsen roses, among others, at a flower and agricultural show at Hastings and at a picturesque nursery situated on the edge of the ancient battlefield of Hastings.

The show was in Alexandra Park. The roses in amateur and trade classes were exhibited in one of many large marquees. As the sun was blazing, the heat under the canvas was stifling, for men and for roses. Nevertheless, the quality of all the exhibits was extraordinarily good. The polyantha hybrids, from their dwarf varieties to the later hybrid polyanthas and the latest floribundas, regardless of their prevenance, seemed to say, "Behold! This is the land we love!" Many originated in foreign lands—Denmark, western Germany, Holland, France, Australia, and the United States.

The two principal trade exhibits were those of the Barnham Nurseries, from near Bognor Regis, and Lingwood's of Crowhurst. Mr. Barnham's hybrid teas were exceptionally well grown. They included 'Ena Harkness,' 'Crimson Glory,' 'Angels Mateu,' most of the McGredy favorites and, among newer introductions, 'Fantasia,' 'Lady Belper,' 'Gay Crusader,' 'Lydia,' 'Mary Wheatcroft;' among French originations, 'Virgo,' 'Grand'mère Jenny,' 'Charles Mallerin,' and 'Sultane,' which here seemed the outstanding bi-color. Both in this trade exhibit and that of Mr. Lingwood, the hybrid polyanthas and floribundas attracted the crowds. We were told that at least half the orders given were for the newer floribundas. Mr. Barnham's three huge bouquets of 'Independence' were incredible, with their blooms as large as those of 'Charles Mallerin,' directly below them. Other impressive floribundas in both exhibits were 'Frensham,' 'Fashion,' 'Masquerade,' and the hybrid polyanthas 'Dusky Maiden,' 'Dainty Maid,' 'Fanal,' 'Else's Rival,' 'Natalie Nypels,' 'Kirsten Improved,' and 'Poulsen's Bedder.'

The next morning, on our way to Battle Abbey, Winchelsea, and Rye, we followed an ancient sunken road which was almost a tunnel under overarching hedges, dank and fragrant between the meadows. We turned into a lane where the warriors of Harold still seemed to walk, and there, on the edge of the downs, where perhaps the meleè of battle was fiercest, were Lingwood's Glebe Farm Nurseries, whose roses had amazed us the day before. During the ten centuries since Harold's death on the Hastings battlefield, there can never have been a more vivid symbol of what happened there than the blood-red 'Independence' (Kordes' Sondermeldung) growing so luxuriantly on this spot. Here were also enormous plants of the bright red 'Frensham,' the scarlet 'Kirsten Improved,' and the scarlet-crimson 'Donald Prior.'

Especially interesting were some new dwarf hybrid polyanthas—'Jean Mermoz' (deep pink), 'Natalie Nypels' (pink with cream base, scented), 'Yvonne Rabier' (white), and 'Little Dorrit' (pale coral-pink, very sunproof). There were many sizes and varieties of tree roses in this nursery. Also propagated here were the hybrid musks and some of Kordes' best park roses. The new Kordes pillar or park rose, 'Bonn' ("Indian red") will soon find its way into many Sussex gardens. Lingwood's best hybrid teas were 'Phyllis Gold,' 'Michele Meilland,' 'Violonista Costa,' 'Texas Centennial,' 'Tzigane,' 'Spek's Yellow,' and 'Charles Gregory.' They were vigorous two-year old plants, grown without application of fertilizer.

Between Hastings and Rye, the Channel and the Downs, roses grow over many a cottage doorway and in all flower gardens. It would be easy to be diverted from a rose journey by the relics of the Cinque Ports, the fascinating Romney Marshes, and the rich literary traditions of Sussex. Between the acts of the Mozart operas at Glyndebourne, we could walk again among roses; at Winchelsea, we wished to linger at the Rose Cottage opposite the church yard, and the old home of Ellen Terry, overlooking the marshes. At Rye, we visited Lamb House, the home of one of our favorite novelists, Henry James. In its roseate red brick of the eighteenth century, it stands at the angle of a steep street, with a high brick wall on one side where formerly stood the famous morning room which was the work shop both of James and of E. F. Benson. That room was destroyed during the bombing of Rye in the last World War. James' smaller study is filled with many personal mementos,

small paintings, drawings, and photographs of himself and his brother William. From the wide glass doors of the dining room, we entered the large walled garden with its herbaceous borders and, in one corner, a delightful, well-planted small rose garden, with a seat. This garden remains very much as it was when James sat and walked and dictated there.

Actually walking in her gardens, we found V. Sackville-West at Sissinghurst Castle, where her house flag was flying on the ancient high tower. The weald of Kent was alive with bloom under a blue sky and drifting cumulus clouds.

"Sink down through centuries to another clime,
And buried find the castle and the rose.
Buried in time and sleep,
So drowsy, overgrown,
That here the moss is green upon the stone,
And lichen stains the keep."

—*From* "Sissinghurst," *by* V. SACKVILLE-WEST, *Hogarth Press*, 1931.

"She's a voluptuary; think of her
Wine-dark and heavy-scented of the South,
Stuck in a cap or dangled from a mouth
As soft as her own petals. That's the rose!
No sentimentalist, no maiden sweet,
Appealing, half-forlorn,
But deep and old and cunning in deceit,
Offering promises too near the thorn.
She is an expert and experienced woman
Wearing her many faces
Pleasing to different men in different places."

—*From* "The Garden," *by* V. SACKVILLE-WEST, *Doubleday*, 1946.

How V. Sackville-West and her husband (Sir Harold Nicholson) saved the old Tudor castle, Sissinghurst, from complete ruin, cleared away the debris of centuries and rescued ancient walls and buildings, how they planned and planted the gardens with hedges, shrubs, perennials, and roses, all was told by the brilliant mistress of the castle in the March - April, 1955, number of THE GARDEN JOURNAL. (My description of our visit in 1952, with many details as to the old roses of Sissinghurst and the beauty of the supplemental planting appeared in THE GARDEN JOURNAL, May-June, 1954.) On the afternoon of our visit last summer, as we sat with our distinguished hostess among the Gallica, Damask, and Moss hybrids, in an angle of the ancient brick walls, we marvelled at the increased exuberance and loveliness of the gardens, since our last visit. We ventured to say that her two long poems, "The Land" and "The Garden," would not have had their inspiration and very authentic quality and power, if she had not known the art of plants and planting so thoroughly. She smiled as she answered, "Yes, those poems would not have happened, if I had not been a hard-working gardener myself." As for roses, she continues to write very personally about them in her columns in "The Observer," which have reached this country in book form.

After returning to London from Kent and Sussex, we spent a Sunday with Robert White who lives north of Aylesbury, on a fertile plateau overlooking the Chiltern Hills. As we stood among his tree roses, budded by Mr. White, heavy with large blooms, and his climbers, fretted high on their trellises, the far prospect of the hills at the horizon, with a broad valley intervening, and the contrasts of cloud shadows, and bright sunlit fields and copses, recalled David Lucas's mezzotints of Constable's England landscapes.

Mr. White, whom we had seen in action at the N.R.S. Summer Show, is a very successful amateur exhibitor, who buds, fertilizes, cultivates, prunes (often mildly, sometimes severely), sprays, but not in our anxious and persistent American way, all his fifteen hundred roses. He personally prepares and shows his exhibition roses. Mrs. White, too, is a successful exhibitor in the decorative bowl and vase classes. To tame the frenzy of the lone husband exhibitor, the practical wisdom of the N.R.S. Annual recommends the teaming of husbands and wives as exhibitors, surely a beneficent sharing of enthusiasm. As Mr. White said, "There are so many floribundas, 'Independence,' for example, that do best in Mrs. White's bowls." The practised art of Mrs. White's hand also contributes the gayety of the annuals and perennials in the borders and interplanting of the large rose garden. But superlative roses reign alone in the "secret garden," all shoulder-high, growing out of black earth, hidden behind a high stile, fences, and dense hedges. An adjacent cow barn and even his own poultry yard furnish the manure. Mr. White often places it to weather between the rows and digs it in as it ages. Grass cuttings are a blanket against blackspot. As many of his plants are more than fifteen years old, he has obviously been able to control both blackspot and mildew.

Svend Poulsen (left) and the author engage in a discussion of Mr. Poulsen's hybrid polyanthas, outside the gate of the latter's country home in Kvistgaard, Denmark.

Although an enormous 'Zephyrin Drouhin' covers one wall of his Tudor cottage to its eaves, his favorite climber and exhibition rose is 'Paul's Lemon Pillar.' (Paul, 1915, 'Frau Karl Druschki' X 'Marechal Niel.') It is so often among his winners that his friends sometimes call him "Lemon Pillar White." The twelve blooms that won him the Edward Mawley Cup in 1955 included: 'Mrs. Barraclough,' 'Rex Anderson,' 'Directeur Guerain,' 'Misty Morn,' 'Mrs. Sam McGredy,' 'The Doctor,' 'Ena Harkness,' 'Mirandy,' and, of course, 'Lemon Pillar.' Among other favorites for competition purposes, Mr. White mentioned: 'William Harvey,' 'Glory of Rome,' 'Monte Carlo,' 'Fred Howard,' 'Charlotte Armstrong,' 'Grand'mère Jenny' ("but it should have more petals!"), and 'Crimson Glory' (but with reservations as to how its center opens).

In addition to his many awards at N.R.S. shows, Mr. White has competed as far away as at the Vancouver, B.C., Rose Show. There his roses, which had traveled over six thousand miles by air, placed second to the winners, exhibited by the director of the Rose Park of Portland, Oregon. A spectacular award was one at the "Daily Telegraph" show in London several years ago. His six red roses had won a

cup given for fragrance, also the award for best rose entry, and he had returned home weary but well satisfied. The phone rang to ask him to come right back to receive the cup as "Victor Victorum," given for the best of all the exhibits in this huge show. But even more satisfying, and probably the happiest of all his awards, was the unprecedented event when he won three cups at the Windsor Show in 1955, and they were presented to him by Queen Elizabeth, the Queen Mother. When she gave him the Osborne Challenge Cup for scented roses, she said, "Mr. White, you must have a wonderful garden!" Then came the Thames Trophy for twenty blooms with which she said, "Well! Here's another for you!" Then came the Romaine Challenge Cup, for twelve blooms of distinct varieties. Upon handing him his third silver trophy, the Queen Mother said, "Mr. White, this must be a great day for you." He replied, "The greatest day I shall ever have, because your Majesty has made it so."

London, Oaklands, and Bayfordbury

The warm weather of July brought the field-grown, two-year-old roses of the nurserymen to a perfection and abundance of bloom which the roses of the Summer Show did not attain. Thus, the Royal Horticultural Society's Fortnightly show on July 26 had nurserymen's exhibits of surpassing quality and variety. Wherever they appeared in the show, the following hybrid teas, which obviously flourish in hot weather, were dominant in color and form: 'First Love,' 'Karl Herbst,' 'Spek's Yellow,' and 'Virgo.'

William Lowe and Son, of Nottinghamshire, had one of the best exhibits. The two roses which seemed to us outstanding were 'Crimson Glory' and 'Lady Belper.' But we also starred: 'Opera,' 'Ville de Gand,' 'Mme. Dieudonnè,' 'Diamond Jubilee,' 'Mission Bells' (which received a medal),'Charles Gregory,' 'Gay Crusader,' and especially 'Eden Rose,' with its deep, rich pink flowers much larger than we had ever been able to grow them. Alex Dickson and Sons of North Ireland featured their celebrated new pink hybrid tea, 'Sir Winston Churchill,' which after receiving a N.R.S. gold medal at the Summer Show, now won a high R.H.S. award. A member of the Dickson firm told us that his firm had received permission to use Churchill's name in 1941, but failed until now to originate a rose worthy of him. "Like Sir Winston," he said, "this rose gets better as it gets older." Other Dickson originations beautifully shown were 'Margaret,' a N.R.S. gold medal winner (pink and yellow) and 'Hebe,' orange-salmon, also a gold medal winner. Very striking were their own floribunda 'Oberon' (soft salmon color) and the American floribunda 'Spartan,' winner of the N.R.S. President's Trophy in 1954. In the Cant and Gregory exhibits, we noted specially a surprising showing of the fifty-four year old hybrid perpetual, 'Frau Karl Drushki;' also 'Tantau's Triumph,' 'Tantau's Delight,' and 'Tantau's Surprise' (a fine, rich dark red floribunda). 'Charles Mallerin' with its great velvety outer petals, was better than we had ever seen this deep red rose.

The firm of E. B. Le Grice of Norfolk showed many excellent roses, but we were most interested in their "maid" series of hybrid polyanthas. Listed in order of their origination, they were: 'Dainty Maid,' single, silvery pink, reverse carmine, scented; 'Charming Maid,' very large, single, orange-salmon with golden centers; 'Dusky Maiden,' large, single, deep crimson-scarlet, said to be the sweetest-scented of the hybrid polyanthas; 'Bonnie Maid,' semi-double bicolor pink; and 'Gypsy Maid,' large, single, brilliant orange and cerise, very fragrant. These exquisite, winsome Le Grice hybrids, frequently out of some of the best Poulsen hybrid polyanthas, deserve a place in our American rose gardens.

After seeing the astonishing effect of late summer's hot sun on the roses at the Fortnightly Show, we hurried to Oaklands, to visit again the trial grounds of the National Rose Society, to see the effect of the continued hot weather on the roses there. The director, William Baines, opened the gate for us. He has been in charge of these trial grounds since their opening in 1950 and was in charge of the old trial grounds, on the estate of Courtney Page, from the time it was started, many years ago. His enthusiasm and hard work have helped enormously in maintaining the high standards of the N.R.S. in these trial gardens.

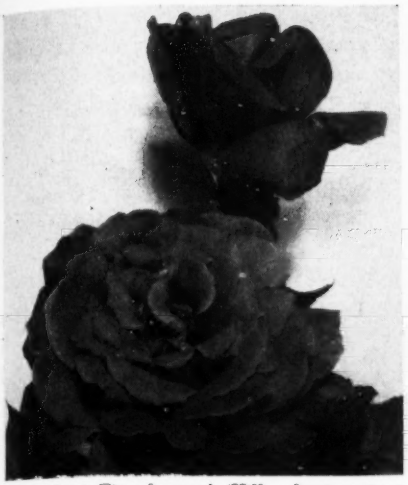
As we entered the three-acre area, with rank upon rank of trial beds, each measuring one hundred and twenty by six feet, the abundance and size of bloom and variety of color of the hybrid teas and floribundas were so bewildering that we could neither compare nor judge. The plants were all stalwart, often four feet high. Brilliant were the many varieties of floribundas, a large number with surprising qualities of color both of bloom and of foliage. Very important to the future development of new varieties were the new park or pillar roses, as well as a number of genuinely continuous-blooming climbers. Around the edges of the trial beds were grouped, in plantings of six, the winners of gold medals and certificates of merit of former years. Here we saw many of our favorites of the Summer Show, incredibly large in bloom and plant.

As compared to our visit in 1952, we discovered that the basis of judging roses had been slightly modified. Under each of four headings, a maximum of twenty points is allowed: 1. Growth (vigor, habit and foliage); 2. Freedom from disease; 3. Beauty of form (of truss, for floribundas) and color; 4. Freedom of flowering. For two more headings a maximum of ten points each is now allowed: 5. General effect, and 6. Fragrance. A sub-committee of four make repeated examinations and reports. All roses receiving 60 points are examined by the full committee. Those receiving 70 points are awarded a trial ground certificate, which signifies that the variety receiving it is one that should do reasonably well in most gardens. Gold medals are awarded for novel and outstanding qualities, as we noted in describing the awards at the Summer Show.

We gave many details about the trial grounds in the record of our visit in 1952, and we wish merely to add that rose growers throughout the world continue to regard with highest confidence, the method of trials and awards of the N.R.S.

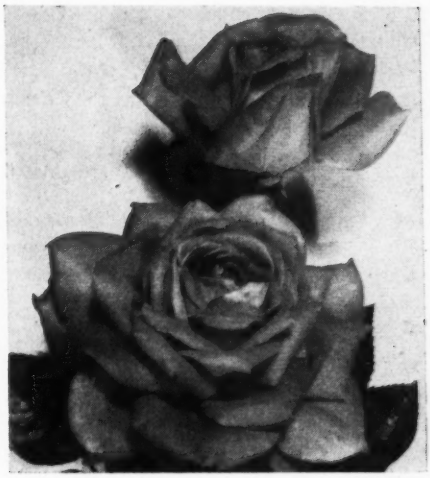
Only a short distance from the N.R.S. Trial Grounds is an institution of special significance not only to rose lovers, but to horticulturists and botanists in general. This is the John Innes Horticultural Institution at Bayfordbury, near Hertford. Its purpose is "to breed

(Continued on page 107)



'President Eisenhower' (Hill, plant patent 1217), the new "American Beauty" has fragrant, rich red blooms.

Star Miniature Rose 'Cinderella.'



'Love Song' (Fisher plant patent 1360), is Conard-Pyle's American bred offspring of 'Peace.'

THE PRODUCTION OF MODERN ROSES

By George Ohlhus

THE CULTURE OF STAR ROSES at the Conard-Pyle Company, West Grove, Pennsylvania, begins with the tiny seeds of the species of *Rosa multiflora japonica*. The seeds were formerly imported from Japan, and from seedlings grown from this imported seed we selected a strain that grew especially well here in Pennsylvania. It is from this strain that we now grow our own seed.

When the seed is ripe about mid-October, it is picked and spread out on a barn floor for drying. After the seed is sufficiently dried, the seed hips are put through an old-fashioned coffee mill to remove the hulls. The seed is then cleaned by blowing out the ground-up hulls. Fifty to sixty days before the seed is to be sown, it is mixed with moist sand for pre-germination.

As early in spring as the ground is workable, we sow the seeds in rows in the field; throughout the summer the seedlings are fertilized, cultivated, weeded, and if necessary, also irrigated. By the end of the first summer the tiny seeds produce good-sized understocks. In November these are dug and graded. Only the best seedling understocks are kept, the small ones are discarded. A sturdy seedling understock is the essential beginning of a healthy Star Rose plant.

During the winter the tiny hair-like roots are removed with a sharp knife to provide a smooth place on the main root stem for the budding operation the following summer; and the tops are cut back to four inches in length and the roots to eight inches. The seedlings are then kept in cold storage until planting time. This kind of work affords year-round employment for our people.

During April of the second spring these same seedling understocks are removed from cold storage and planted in the fields, which have been previously prepared over a period of four years. The understocks are planted in rows three and a half feet apart, and the spacing in the row is eight inches between plants. This spacing allows for the development of a good root system and a good plant. The understocks are mounded with soil to protect them from drying winds and sun. This mound is removed after the plants have started to grow, thus exposing two to three inches of the main root stem in preparation for the budding operation, which takes place early in July and generally lasts through September. These understocks are budded by placing the bud into the main root stem, not into the crown. Placing the bud into the root system prevents suckers of the original wild understocks from forming, as occasionally happens to plants budded on cuttings. In our budding operation, we select only well-formed and mature eyes from strong, healthy canes from vigorous plants. Buds taken from a small plant or from weak canes cannot help but produce a poor plant the following season. The majority of these eyes, after they have been budded into the understock, will remain dormant the rest of the season. Late in October the buds are protected against the winter with a mound of soil. Buds that have started to grow out are cut back to prevent their being blown out by wind. During the time that these plants are being mounded up, we also apply fertilizer as needed according to soil tests. These plants, of course, have been undergoing constant cultivation and weeding during this their second season.

In early spring of the third year, generally during the latter part of March, these multiflora understocks are cut back—this means that the whole top of the plant is cut off, only the root with the inserted bud remains in the ground. The wild tops are raked off and burned. After all danger of heavy frost is past, the mound of soil is removed. Now the buds start to grow out; most buds produce at first only one cane. After this cane has sufficiently

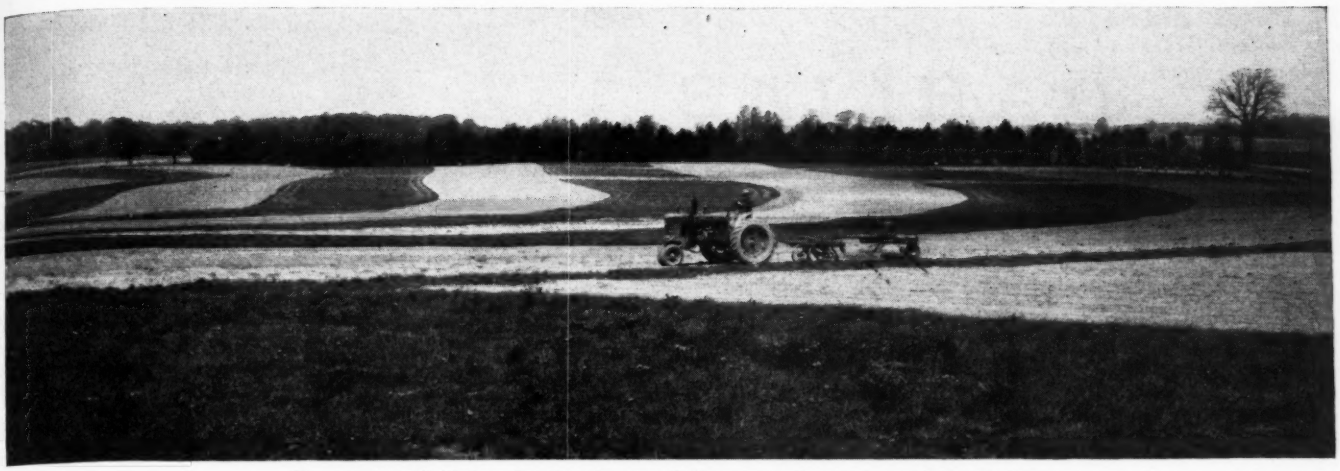
thickened and is about ten to twelve inches tall, begins the very important job of forming a bushy plant with enough canes to grow into a sturdy No. 1 plant. This is done by pinching back the first canes, leaving about four fully developed leaves. This pinching induces the plant to break from the base and produce more canes; it may have to be repeated several times in order to produce enough basal canes. At this time we also add the remaining fertilizer as needed and determined by soil tests.

As soon as the first leaves are fully formed, we begin with our spraying program against disease and insects—another very important phase in the production of strong and healthy plants. We spray once a week or every ten days, according to weather conditions; during wet spells, we may spray more often. Again, through this season the roses are cultivated and kept free from weeds by hoeing. Toward the end of October, the plants are fully grown and ready to be harvested. The tractor with a sharp U-shaped blade moves slowly down the rows of roses, well underneath their roots, and partially lifts them from the ground. The plants are then pulled out of the ground by hand, tied in bundles of fifteen, labelled, loaded immediately into covered trucks, and rushed to storage cellars in order to prevent the roots from drying out. There they are moistened, graded, trimmed, and individually labelled for shipment to our customers. The roses that are not shipped in the fall, are stored over winter in moist peat moss, in our own storage cellars, where the temperature and humidity is constantly watched, so that each individual plant remains in excellent condition until shipped in spring.

Due to the short time we have to harvest the rose crop before heavy fall rains, and perhaps before an early winter sets in, we sometimes have to run heavy tractors and trucks on the ground when it is wet, thereby compacting it and damaging the soil structure. Therefore, weather permitting, immediately after the rose crop has been dug, the ground is plowed and left to lay open over winter to allow the frost to enter the ground and make it more workable. The following spring the ground is sown in oats and grass after fertilizer and lime have been applied. The oats is used as a mother crop to shade the grass and help to germinate the grass seed. After the oats has fulfilled its purpose, it is mowed down and left on the ground as green manure. The second and third years the ground is left in grass, and it is mowed periodically during these summers. The grass is fertilized to produce lush growth and good roots. During the fourth year the the grass is plowed down in May, and the ground is harrowed and disked until the soil is very fine. Next we chemically treat all ground against any possible insects or diseases. Then we apply fertilizer and sow Sudan grass about the first of July. Sudan grass makes very quick and lush growth, sometimes to a height of five to six feet, and it is mowed down for green manure just before it goes into seed. After it has reached maximum growth in September, we plow the Sudan grass under, at the same time subsoiling our ground. In subsoiling, we loosen the subsoil about twelve to fourteen inches below plow level. This breaks up the subsoil, rendering it more porous and giving the ground better drainage, and at the same time making it retain the moisture better during dry summers. The ground is left open over the winter months and planted the following spring to our special strain of *R. multiflora japonica* understock, the beginning of another Star Rose crop. In other words, we spend four years building up our rose ground, the fifth year the understocks for budding are planted on it, and the sixth year the budded roses are grown.

Since all our ground is rolling, we have adopted contour and strip farming. Before we adopted contour farming and planted in larger blocks, much of our fertile topsoil was washed away; sometimes, during heavy rainstorms, gulleys would be washed in our fields. Our ground is now laid out in alternating strips of roses and grass. Each strip is eighty-four feet in width. In the event of heavy rains, and if there should be some soil erosion in the rose strips, the grass sod will retain the soil and stop the wash or gulley. Eventually, a rose strip reverts into grass and the grass strip goes into roses, thereby utilizing all our ground to the best advantage and at the same time rebuilding the soil fertility. The eighty-four foot width of these strips allows us to plant twenty-four rows in each block and is more convenient for spraying. We use a five-hundred gallon power sprayer and spray eight rows at one time. In this manner, three trips with the power sprayer covers one complete block. Dur-

This is the first year production from multiflora rose seeds in contour stripped growing field of the Star Rose Gardens of Conard-Pyle Company at Jennersville, near West Grove, Pennsylvania.



Preparing a field for planting *Rosa multiflora japonica* understocks in April.

ing rainy weather, when the cultivated ground between the rows is too wet to drive on with the heavy tractor and sprayer, the roses can be sprayed from the grass strips by a side-boom or cyclone sprayer. Contour planting not only preserves our soil and soil fertility, but also facilitates our spraying program. It is not only functional but beautiful as well.

In this manner, the Conard-Pyle Company has striven for fifty-seven years to maintain a high standard of quality and dependability, and to bring to their customers only the best rose plants that can be grown.

ROSES IN ENGLAND **(from page 104)**

new fruits and flowers and to improve their cultivation; and also, by studying cells and chromosomes under the microscope, to try to discover the laws governing heredity and evolution in plants ..." It was established under the will of John Innes in 1910, with William Bateson, F.R.S., the pioneer geneticist of England, as its first director. Its original location at Merton was inadequate, and was bombed; about twelve years ago, the Innes trustees purchased the large historic Baker Estate, with over four hundred acres, at Bayfordbury. The eighteenth-century mansion, of eighty rooms, now provides adequate laboratories, conference rooms, and libraries, for a staff of about fifty scientific and office workers. There are about the same number of outdoor employees who take care of the elaborate plantings of trees and shrubs, and the eight glass houses, including the famous "Glass Corridors," where unusual experimental planting is carried on.

For the study of roses, the National Rose Species Collection was established in 1948. It consists of one hundred and ten authenticated species and about twenty natural hybrids, in twenty-two plots extending for about a fourth of a mile. There are many examples of the same species, from different countries. Here the attempt is made to indicate the progress from species to sub-species hybrids and garden roses. As Mr. Rowley, who has charge of the roses, says, it is possible to see here the *R. spinossissima* and its derivations, all the way from 'Harison's Yellow' to Kordees' 'Frülingsmorgen,' to give one example. This garden is supplemented by several additional gardens. There is also a large Geneological Garden, to which Graham Thomas in 1950 contributed about three hundred and fifty of his old shrub roses, the subject of his recent book, *The Old Shrub Roses* (Phoenix House, London). Here one can trace garden roses from the single species to the complex garden roses of today. It is "laid out to form a living family tree" of rose varieties, for here are the earliest Gallica hybrids, the Portlands, Bourbons, Bengals, the teas and hybrid perpetuals, ending with examples of the

(Continued on page 120)

A field of roses planted on the contour system — in full bloom.

DAHLIAS

By Grace Swanson

Entered in a flower show class to portray a hobby—ceramics. The modern sculpture is of red clay on a plaster bat and wood turn table; accessory is a lump of red clay, and background brown burlap. Floral materials are dahlia 'Helen Brett,' fantasia palm (beige in color) pandanus, ti and pothos leaves, and mountain-ash berries.

I LIKE TO ARRANGE DAHLIAS — first, because they are among my favorite flowers and we have grown them in our garden for many years. To arrange any material well, you have to know it, and because I have always had dahlias available, I have been able to practise with them and have learned what they will do for me. I also like to arrange dahlias because of their wonderful color selection. There are dahlias in all the hues of the spectrum, except the blues, green-blues, and blue-greens, and green. Actually there is a green dahlia, one of the species, *Dahlia viridiflora,* which produces green flowers. So with all these colors to work with, I can create any color harmony that I desire.

There are brilliant, intense colors in dahlias; also shades, tints, and tones of many colors, and beautiful pastels and combinations or blends. If you love color, the dahlia is the flower to use. The only flower that can compare with the dahlia in its color range is the gladiolus. I like to use both gladiolus and dahlias in arrangements, because the spike form of the gladiolus is a contrast to the round form of the dahlia, and as both have the same substance and texture, they do belong together. The colors of gladiolus and dahlias complement each other or blend with each other in a most pleasing manner.

The variance in size of blooms is another desirable feature. I agree that the large "A" size decorative bloom, grown to twelve or more inches, is not a good arrangement flower. But the "B" size dahlias from four to eight inches, the miniatures from two to four inches, and even the smaller pompons from one-half to two inches are most desirable for arrangements. My preference in dahlias for arranging are the "B" size blooms from four to five inches; however, for the past two years in one of our dahlia shows, we have had a class featuring the "A" size blooms, and I must admit it has been amazing to see what can be done with one or two of the huge blooms. All you need is enthusiasm to start, practice to develop the art—and you can use any size material.

The fact that there are so many types of dahlias—formals, informals, semi-cactus, and cactus types in "A" size, "B" size, and miniature blooms is another reason why they are fine arrangement material. And there are ball dahlias, anemone, collarettes, orchid-flowering, and peony. With all this variety, any study that you may wish to create can be executed with dahlias.

Dahlias have good substance, are sturdy in character, and have strong stems. For this reason, they can be used in either wood or metal containers. On the other hand, they are elegant enough to be used in alabaster and porcelain containers. I do not mean that every type would be suitable, but you will find varieties that can be used in very fine containers. Glass is, perhaps, the least suitable container material for dahlia arrangements; but the modern glass containers of heavy glass, giving the feeling of great weight, especially those of smoke color or dark green, would be appropriate.

Because dahlias belong to the Composite family and because of the round form of their flowers, I select material of great contrast to use with them in arrangements. I use spike forms and, as stated before, the one that I use more than any other is the gladiolus. Delphinium are good, too, if the spikes are large and heavy. The use of delphinium permits the introduction of blue into dahlia arrangements. Liatris is another spike that can be used. The number of spike forms available at the same time the dahlias are at their peak is somewhat limited, but there is no limit to the variety of foliage and seed pods that combine beautifully with dahlias.

The dahlia foliage is almost always a deeply cut leaf and because the dahlia bloom has many petals, I like to use a completely different type of foliage to give the needed contrast.

I grow both the green-leaf and red-leaf cannas for foliage forms in dahlia arrangements. Both the bud and the seed pod of the canna are excellent material. Another "must" in my garden is horse-radish. During the summer, it is necessary to spray the foliage to ward off chewing insects, but by fall I have good horse-radish foliage with the most beautiful curved line and of marvelous texture. A favorite combination is a copper container, horse-radish, saxifrage leaves, and dahlia 'Broeder Justinus'. The leathery saxifrage *(Bergenia crassifolia)* is another plant I grow for foliage. This is a round leaf but again one with wonderful texture and, in addition, it lasts for a long time after it has been cut.

The large-leaved plantain-lilies *(Hosta)* are good in combination with dahlias. By September many of the leaves have brown edges, but these can be trimmed carefully with a scissors, and if it is done skillfully, they can be used in shows. I grow every kind of *Hosta* listed in the catalogs, as all have foliage of such beauty, most useful in many types of arrangements.

Plants of coleus (I always grow coleus from seed) furnish attractive leaves for dahlia arrangements. I use them as an artist would use a darker color for shadow. I tuck the leaves of coleus back of and under the dahlia blooms in order to emphasize the color

by producing a shadow. Coleus comes in rose, red, pink, orange, yellow-green, and sometimes an almost white foliage, as well as very dark red shades, some being almost black in color. All can be used to great advantage.

I also enjoy using mullein leaves and the beautiful rosette of gray-green leaves that is characteristic of this plant the first year of its growth. The soft velvety texture of the mullein *(Verbascum Thapsus)* is lovely any time, and it combines so well with dahlias. I like to arrange a white cactus dahlia with mullein leaves in a copper container with a pewter wash, with perhaps a dried branch for the line material. A bright red-orange dahlia is another pleasing color combination with the gray-green mullein foliage.

Euonymus vegetus is another one of my preferences for foliage. It usually grows with nicely curved branches, and the glossy green leaves are so attractive and long lasting. I like to arrange this foliage with 'Little Diamond,' a pink miniature cactus dahlia. White dahlias are also good with *E. vegetus* or *E. patens.*

Cotoneaster horizontalis is a good shrub, producing line material that lends itself admirably in combination with miniature formal dahlias. As the name implies, it can be used very well in horizontal line arrangements.

I always grow some vegetables just for their leaves for dahlia arrangements. Both the green Swiss chard and the beet or red chard yield foliage that is dramatic in line and texture. I use the spike form of okra in dahlia arrangements, especially because of the curves I can obtain from this plant. Cardoon is another vegetable that gives foliage of unusual texture and design as well as a gray-green color. I have used cardoon with dahlia 'Little Lemon Drop' in a yellow-green ceramic container very successfully.

An oak branch, mullein rosette, dahlia 'Aristocrat,' and green glass slag to cover needlepoint holder in a copper pewter washed container on a black carved base.

Many house plants can be grown for foliage usefulness. One very useful spike form is sansevieria. Dieffenbachia also is good with dahlias. I enjoy many of the Rex begonias both for texture and color. I remember an arrangement in a lead container—a weathered branch of cypress, gladiolus from pale lavender to red-violet, 'Jean Trimbee' dahlias, and Red begonia leaves that shaded from pale blue-green to violet and red-violet. This was entered in a class entitled "Drifting and Dreaming."

Because of the size and texture and color of the foliage of many tropical plants, I find them effective in dahlia arrangements. Both the green and the red ti leaves, dracaena, pandanus, croton, and caladium leaves are all most useful, nor do I overlook the beautiful foliage of philodendron species or varieties. I grow many of them just for cutting material.

There are many fascinating seed pods that I enjoy using in dahlia arrangements. The red castor bean is a particular favorite. The orange berries of the mountain-ash I use many times. Pyracantha is another shrub producing gorgeous fruit that says "Use me," and flowering crabs offer attractive fruit clusters. Try wiring the fruit of the "Hopa" crab and using it in a cluster for an outstanding effect. The fruits of the wild crab make lovely bunches of green grapes, when wired and assembled in this manner, and in a green and white arrangement are very distinctive.

Celosia furnishes no end of beautiful color to use with dahlias. A winning combination for me last year was made up of dahlias 'Grace,' and 'Juanita," red ti leaves, dark red croton leaves, celosia 'Toreador,' an eggplant, and dark blue grapes in a copper pewter-washed urn, placed on a black marble base.

Some dahlias are much better as cut flowers than others, and it is necessary to experiment to find the varieties that will hold up best. I condition dahlias overnight in warm water before arranging them. I prefer cutting them late in the evening; taking a bucket of water to the garden, I place each bloom in water as quickly as it is cut from the bush. Then I take the dahlias to the basement and cut each stem under warm water. Perhaps I should explain that in making the cut under water, I make the cut with the knife while I am holding both the knife and the dahlia stem under water. I hold the stem under water until the air bubbles disappear; then pressing my finger under the cut stem, I place the dahlia in a bucket of warm water. I usually make the cuts under water in the laundry tubs, as they give me a large work area. If I need to cut a stem, when arranging dahlias for exhibition, I try to make that cut under water, before placing the dahlia in the arrangement.

Dahlia 'Grace,' celosia 'Toreador,' lavender liatris, pink ti leaves, and dark red croton leaves arranged in a hand-made lead container on a gray wood base.

Here are some of the dahlias that we grow that I especially like for arranging:

'Ambassadeur Van Kleffens' is an orange formal decorative, "B" size, which I like because of its keeping quality and because it combines so very well with 'Broeder Justinus,' a "B" size semi-cactus. The yellow and or-

Dahlia 'Broeder Justinus,' tritomas, croton leaves, and Mexican corn placed on a serape with two Mexican jugs as part of the arrangement entitled "Down Mexico Way."

ange blend in 'Broeder Justinus' is so beautiful; when it glows in the garden, it seems to be part of the sunshine itself. It, too, is a good cut flower.

Aristocrat, "B" size straight cactus classified as a red, is really an orange-red. This variety has a tendency to fade in the sun, but if cut at its prime, is a fine red in an arrangement. 'Aumonier Chandelon' is a blend of yellow and pink, a "B" size straight cactus. One of the older varieties — and also an "A" size dahlia that is a good cut flower— is 'Black Monarch.' It is dark red in color and when arranged with Sarett's 'Pink Flamingo,' another "A" size flower, makes a beautiful combination. 'Bunny' is a "B" size straight cactus, yellow in color and one of the newer varieties. 'Finesse Anversoise,' a "B" size straight cactus classified as yellow, is really a yellow-green. If you like chartreuse as a color, then you will enjoy this variety—a truly beautiful arrangement flower.

Another dahlia that is a "must" in our garden is 'Grace,' a "B" size straight cactus, lavender in color. In our garden besides wanting to grow good cut flower varieties, we want varieties that will produce many, many flowers, both for use and color effect. This is another reason for growing 'Grace.' It is prolific, and each bloom is held on a long sturdy stem, making it a perfect arrangement flower. One of the dahlias that I use in combination with 'Grace' is 'Juanita,' a "B" size straight cactus classified as red, but actually a red-violet in color. 'Juanita' is also an excellent grower, producing many flowers on good long stems.

'Helen Brett' is a "B" size cactus, classified in the autumn class. This, too, is a prolific bloomer and an excellent arrangement flower. Perhaps two of the oldest varieties being grown in dahlia gardens are 'Jean Trimbee' and 'Jersey Beauty,' and these two are still favorites of mine. I love the formation and color of 'Jean Trimbee.' As a specimen bloom its formation is not one of the best, but for arrangements it is lovely. The color is a deep violet, just right with lavender gladiolus and making a combination long to remember. 'Jersey Beauty,' a formal decorative pink, is a grand cut flower.

Two fine white dahlias are 'Margraten,' "B" size cactus, and 'Michigan White,' "B" size straight cactus. The latter is a good cut flower and a good bloomer, and has been a desirable variety in the white class for many years. "B" size 'Velvet Marvel,' an incurved cactus, dark red in color, is well named as it has the appearance of velvet.

Some of the miniature dahlias satisfactory for arrangements are 'Andries Orange,' 'Cheryl Anne,' 'Decoy,' 'Hazel Harper,' 'Little Diamond,' 'Little Lemon Drop,' 'Little Sheik,' 'Red Shadow' and 'Zest.' The last three are bi-colors in a red and white combination. A new variety that we shall be growing in our garden this year is a miniature red named 'Franny Grace.' I am very proud to be the namesake for the last half of the name of this dahlia, as it is most outstanding. It has a glowing red color that is really different. 'Easter Greetings' is listed as a dwarf dahlia, and the white flowers are semi-cactus in form. It can be grown as a border plant and does not need staking. 'Easter Greetings' can be used in an arrangement where a great deal of water is exposed, as the flower actually resembles a water-lily. Another good border variety is 'Roquencourt,' which has stunning bronze foliage. The flowers are red-orange, and many have brown centers. This is a duplex type and always greatly admired. I like to arrange 'Roquencourt' in a low copper bowl with begonia foliage of a metallic texture that seems to belong to both container and flower material.

I have many containers that I enjoy using for dahlia arrangements, but my favorite is the copper with pewter wash. Some of copper are also precious, and I would not part with an old iron wine beaker or a flat iron muffin pan. I also have certain ceramic pieces that have been used many times.

I only hope that what I have written about my experiences in arranging dahlias will inspire you to try using these choice colorful flowers alone or combined with foliage and other flowers in some of your cherished containers.

GROWING DAHLIAS UNDER CLOTH

By **Jesse L. Strauss**

I HAVE BEEN GROWING DAHLIAS under cloth for the past eighteen years, as I try to grow my blooms to perfection and feel that growing dahlias, as well as any other flower, is done much better under cloth than out in the open.

The most obvious difference is in the color of the bloom. Flowers grown under cloth have a clearer and richer color, hold the color longer, and have far better petalage. I find that dahlias grown under cloth tend to grow longer stems, with larger individual blooms. This is very important in the large flower varieties.

I also find that a bloom under cloth will remain in good condition two or three days longer. This is definitely an advantage if the cloth house is small, as the flower will keep for a show which might be two or three days ahead.

If the temperature drops a degree or two below freezing, the temperature under cloth will remain above freezing. I find that I can hold my flowers two weeks longer in the cloth house than the flowers grown in the open.

My cloth house is fifty-seven feet wide, and eighty-five feet long and nine feet high, and holds five hundred hills. My house is divided by a walk. On one side I grow the "B" size dahlia and on the other the "A" size. The sides of the house are made of sixteen-inch copper screening which, by the way, has been in since the house was

(Continued on inside back cover)

Hunting Oregon Iris

By **Donald P. Rogers**

BY THE TIME we had moved from our Corvallis apartment to a gray-shingled cottage with a garden we knew what we wanted to grow there. Iris—not only the big bearded iris, although we planted lots of them, too; but Oregon iris, the little native species such as we saw in the hills outside of the town and learned about from the tantalizingly dry descriptions in the floras. Before we had gone to Oregon the name iris had meant the comfortable, floppy, purple or tan-and-red flag lilies of everybody's front yard or the leggy wild blue flag that looked so fresh and smelled so sweet growing in the bog and wilted so miserably before we got it home. Oregon iris, we found, are different; the wild ones, that is. For one thing, they are small; most of them bear their flowers less than a foot above the ground. For another, most of them are evergreen; the leaves are narrow, dark green, almost as hard as a holly leaf; and when they do die, just before the new crop comes up, they remain attached to the rootstock for another season or two. For another, the flowers are rather flat, more like Siberian iris than a bearded one; but where the flower of the Siberian is too small for the plant, that of the western Oregon iris is relatively large—in fact, just the right size. It is graceful but not skimpy, brilliant but not flamboyant, a perfect flower on a perfect plant. And so we set out to get all of them.

In west central Oregon, where we lived, *Iris tenax* seems ubiquitous. In reality it never grows in the big woods nor in the wet flat lands along the river. But on the open fields, even the pastured ones, or the brushy hills not shaded by too many trees, it is one of the commonest of spring flowers. Most of those we saw were lavender; but on one hill many were a good clear violet. A strong plant would carry a dozen or twenty stems, each with two or three buds; the polished leaves arched away from their base so as to frame, rather than hide, the flowers. We spotted the best, brought in a few, and went back afterward to collect seeds from others. Later when we extended our hunt northward and towards the Cascades, we found that *tenax* had more to show than we saw in our home hills. Forty miles south of the Columbia there is a region where all the flowers are pink, light pink to rose-pink. And on one butte west of Mount Jefferson we commenced our climb along a trail bordered by lavender *tenax* and found them paler as we went higher, until on the top every clump was white. Some of those went into the garden, too.

Not long after we began collecting *tenax* we made up our minds to have *Iris tenuis*. The books and herbarium specimens told us that it ought to be easy to find and recognize. It grows, we learned, only in an area a few miles across along Eagle Creek; its leaves are not dark and evergreen, but bright and annual, something like those of the eastern *Iris cristata;* and they grow in two overlapping rows like those of the bearded iris. The flowers are white; but since we started looking for the plant early in the spring, when there would be no flowers, that didn't help much. One Saturday morning we set out in a car, and so did others from the department, in a sort of friendly rivalry. We drove every road that crossed or approached Eagle Creek, and one or two stretches that couldn't qualify as roads. No *tenuis;* no iris of any kind, or occasionally a leathery-leaved plant that had to be *tenax*. But before the afternoon was quite gone we found a colony of plants that were quite different; just what we were looking for. We counted them over, consulted our consciences, took up only as many as we thought could be spared, wrapped them carefully, and headed back for a late supper. Monday morning, when we showed up at the herbarium with our haul, we found that the other party was already there, and just as ready to gloat; they had found another patch. The plants were carefully planted and tended, and two months later some of both lots bloomed, with the unimposing greenish flowers of a rush. From this experience we learned that *Iris tenuis* does not grow along Eagle Creek and that none of us could tell *Iris* from *Juncus*.

Six months later one of our former freshmen came into the office, back from his summer vacation. "You were looking for iris," he said; "I found some white ones last June and thought you might want to see them." "Where did you find them?" "Northeast of here, over toward the Cascades." "Oh, those," we said; "that's the white form of *tenax;* we found it on the butte." "But this wasn't *tenax;* the flowers are flatter, and the leaves are thin and light green." "Then, that's the one we hunted all over Clackamas County. You've earned a medal. How do you get there?" "Well, you turn off the paved road . . ." And so when another June arrived that's just what we did. We drove through dense conifer woods, along a rocky trail, and there they were, growing among the rocks, in deep shade, and the best of them on dripping cliffs along with maidenhair fern. No place for an iris, but these were thriving; porcelain white flowers with a big golden blotch on each sepal, on clean wiry, arching stems; and thousands of them. That was one of the rewards of teaching taxonomy to a freshman class.

Tenuis was the occasion not only of pleasure but also of a good deal of botanical indignation. Most of the students of *Iris,* beginning with Dykes, have assigned it to the same group as the evergreen species. It has only enough in common with the other Oregon iris to put it in the same genus; in almost everything else—form, structure, habit, and habitat—it is different and much more like the eastern *cristata* or the Asiatic *tectorum*. Also, although most of the Oregon iris will hybridize freely, *tenuis* can be crossed with none of them. But it grows nowhere else; it is an Oregonian if ever there was one.

Not everyone agrees that *Iris Gormanii* is a good species, but everyone who has seen it growing agrees that it is one of the most beautiful of iris. It is another whose area we knew exactly. It

grows along Scroggins Creek, in the Coast Range a little south and west of Portland. Since we had business in Portland one Saturday, we decided to hunt *Gormanii* on the way home. On the map it isn't far, and we allowed ourselves an hour or so of daylight to find it; as soon as we turned into Scroggins Creek Road, we kept a lookout for a yellow iris. But the creek and the road ran on and on to the west, and all the iris we saw were lavender. For a while we didn't see any iris at all, and presently the sun dropped below the horizon and the moon came up. Then, on a hill we were climbing, we saw clumps of iris alongside the road and decided that it must be here or nowhere.

But the iris were the wrong color; and we took off up the slope. Along a couple of brushy fences, through a bit of woods, along another fence to the right, and there, on the edge of an old pasture, were the iris — lots of them, and the right ones. Or were they? No one who has not tried to tell lavender from creamy yellow by the light of a low moon can appreciate the difficulties of collecting under such conditions. Unquestionably they were iris, even by moonlight, and unquestionably light-colored ones; but lavender, or yellow? Since they were plentiful, we took a dozen, and next morning found that we had both *tenax* and *Gormanii*.

We went in the other direction for *Iris chrysophylla* — south and east, toward Crater Lake. *Chrysophylla* often grows higher than the other species, among bunch-grass, and in the open forests of the southern Cascades. The leaves are a good deal paler and more erect than those of the others, and the flowers, so short-stemmed that they sit close to the ground, are less showy. For these reasons, and because its roots are so long and deep that the plant is hard to move, it is not so desirable as a garden plant. But the translucent white flowers, veined with violet and washed with pale yellow are the most delicate and fragile-looking of all. We took some and planted them where we could get down on our knees to enjoy the bloom.

Iris missouriensis goes to the other extreme; too tall. We found it on a summer trip east of the Cascades, where the season is late because of the altitude, and flowering is equally late. We had driven down the slope east of Mackenzie Pass and at supper time had settled down for the night in a cabin at the quiet little village of Prineville. At seven o'clock we learned why it was quiet: because of supper time. The local lumber mill, busy with a rush order for timbers, started its night shift about then, and we slept in five-minute snatches, when the head-saw was not chewing through yellow pine. At daylight we packed up and headed away from the mill, and the first slough we came to was circled with *missouriensis*. It was worth seeing, but not worth planting: even leggier than the eastern blue flags, with smaller flowers and no odor.

Before ever collecting it, we had seen *Iris innominata* in William Borsch's wonderful alpine nursery near Portland. The plant is like a miniature *tenax,* with glossy ribbon-like leaves spreading out from the rootstock and nearly lying along the ground. The stems are slender and wiry and only three or four inches high. And the flowers, huge for the tiny plant, but still graceful because of their slender parts, are, in typical forms, a brilliant yellow—canary-yellow, buff-yellow, or a luminous golden-yellow that seems tinged with salmon. Other forms are violet; but the yellows are typical, and the best. We should have said that no such iris could exist; but there it is. To find it we went down the coast to the southwestern corner of the state, to Curry County, where there is really only one road, along the Pacific from north to south. We turned east at one of the little rivers that flow out of the Coast Range, followed a graveled track for five miles or so, and there under the conifers found what we had come nearly four hundred miles to see, the true yellow *innominata.* Climbing the hill away from the river we came on something nearly as handsome and more unexpected—a dove-colored colony, and another with ivory petals and rust-colored sepals. They were apparently natural hybrids; with the typical plants they were set out, and throve, in our garden.

From that trip we returned along the other side of the Coast Range on the road past the Oregon—repeat, Oregon —redwoods. Beside the road as it ran through deep forest we found another of the Oregon iris, *I. bracteata.* In the woods the plants were nearly a foot high, but even so carried only two or

A strong plant of *Iris tenax* carries a dozen or twenty stems each with two or three buds or flowers.

three of the very heavy, stiff leaves that characterize the species. The flowers were the largest we had seen, well over three inches across, pale warm yellow and heavily veined and speckled with cinnamon and violet—almost exactly the colors of the yellow emperor moth. If the plants would only grow vigorously in the garden, they would be hard to improve on; but the roots are as few as the leaves; they are hard to dig and harder to grow. A little farther north, on the volcanic ash around Selma, we found smaller, paler forms; they didn't do any better for us. Seeds are the answer, of course.

Another trip along the coast highway gave us the strongest and easiest of the western Oregon species, *Iris Douglasiana*. It seems particularly happy on the headlands above the Pacific, but a few patches grow on the hills a little farther inland; in fact, it is probably this iris that gave us the odd hybrids with *innominata*. The leaves are leathery and nearly a foot high. Most of the flowers are a somewhat drowned-out lavender; but occasional good blues and even now and then a white can be found, and we chose the best colors we saw. Since then we have learned that *Douglasiana* does well not only in Oregon gardens but in less favored spots; it and *innominata* grow and bloom for us in New York.

Farther on down the coast we turned up the Chetco River into the Coast Range, followed a forest service trail up and down some of the steepest hills we had ever driven, and at ten at night reached the end and rolled out our sleeping bags in a little grove of chinquapin. At daybreak we were wakened by half a dozen small gray burros, that stood looking us over with the same curiosity that we felt toward them. After breakfast we set out to collect not iris but fungi; but the first thing we came upon, outside of the grove where we had camped, was a field of little iris. They were everywhere, innumerable. There was not a flower in the lot, but the spreading leaves and short round seed-pods were surely those of *innominata*. This was a find—a thousand for every one we'd seen before. When we tracked down the owner of the burros, we asked him how far the stand of yellow iris went. "Yellow?", he said. "These aren't yellow; they're blue." "Oh, no," we said; "these are *Iris innominata*." "I don't know the name of them," he said, "but I've seen them in bloom; they're all blue; you won't find the yellow ones until you get way north of here."

So we collected: seeds, living plants, herbarium specimens; and they all (except for the herbarium specimens) grew. The next spring we came back; and they *were* blue. They were not only around our camp, but along half the length of the trail leading to it; all blue. They were beauties, and they were new; or almost. The species had been described, the year before we found it, from a handful of miserable dried specimens collected five miles over the state line: *Iris Thompsonii*. But anyhow, we ended by having in our garden all the Oregon iris. All, that is, unless there is another *tenuis* or *Thompsonii* hidden away along some out-of-the-way creek. Perhaps we ought to go back and see.

NEMATODES AND SCORCH IN IRIS

By L. F. Randolph

From the Report of the Scientific Committee of The American Iris Society for 1955, L. F. Randolph, Chairman, and reprinted in these columns with permission of Dr. Randolph and the American Iris Society. —The Editor

THE DISCOVERY of the root knot nematode *(Meloidogyne incognita acrita)* in the fibrous roots of irises imported from Europe and from gardens of northern Texas has complicated the problem of disease and pest control. Injury to the feeder roots caused by nematode infection may produce symptoms similar to those of the disease commonly known as scorch. Losses of eighty-five to one hundred per cent from dead foliage and shriveled rhizomes were reported by Guy Rogers and Z. G. Benson of Wichita Falls, Texas. When diseased plants from their gardens were examined by expert nematologists at Cornell, they were found to be infected with a species of nematode that produces swellings or knots on the roots and is known to be the cause of serious injury to many plants.

A preliminary report on studies of nematode infected iris plants was published by Dr. C. I. Hannon in the April 1955 Bulletin of the American Iris Society. In the same issue, Geddes Douglas suggested steps that should be taken to rid the soil of nematodes, and treatments that might eliminate the disease from infected plants. But as Guy Rogers emphasized in a very informative article on descorching scorch in the July 1955 Bulletin, it is extremely difficult to destroy the cyst form of the nematode.

In this connection it is noteworthy that nematode infection has been detected at Ithaca only among plants recently imported from Europe. These plants were entered under a permit issued by the Bureau of Entomology and Plant Quarantine and had been inspected and fumigated in transit at the Plant Inspection House, Hoboken, New Jersey. Apparently, treatments that effectively destroy most pests do not destroy the root knot nematode of iris. Fortunately, these infected plants were placed in our greenhouse on arrival rather than in the garden, and the disease has had no opportunity to spread to healthy plants in our test plots.

We have been unable to find any evidence of root knot nematodes in any of our field-grown irises. Our search for evidence of the disease included a thorough examination of plants sent to us two or three years ago from Texas by Guy Rogers. His 'Senorita Ilse' grows very well here and shows no evidence of the disease. His 'Lady Rogers' and 'Front Gate' also show no symptoms of nematode injury. There is a definite possibility that our winters may prevent nematodes from becoming a serious pest of garden irises in the northern part of the country.

Since the nematode-infected plants sent us for examination from Texas had pronounced foliage injury similar to that of plants with severe scorch symptoms, we proceeded to investigate the possibility that scorch in our own garden was being caused by nematodes. All of the plants we could find in our experimental plots that showed any symptoms of scorch during the early growing season last spring were collected and given a thorough examination by experienced technicians in the laboratory of Dr. W. F. Mai, nema-

(Continued on page 120)

Upper left. Early July along the south shore of Hudson Bay.
Lower left. Tundra country around Churchill, northern Canada.
Upper right. Hudson Bay Company post at Churchill.

THE EDGE OF THE ARCTIC TUNDRA

By Walter W. Shannon

EVER ON THE ALERT for off-the-beaten path vacation possibilities, I noted with growing interest increasing references to the Canadian north. Here are the largest Arctic and sub-Arctic territories in the world, but there is less scientific information about them than practically any other northern lands. Much of this region is still an unknown quantity—a country of unanswered questions, of geological puzzles and scientific mysteries. It is a land where the very vastness takes on a sort of grandeur. In an overcrowded world the Canadian northland is now being examined with a new regard, but it remains a frontier with only two important resources, furs and minerals. Its military importance is being stressed by the current installation of radar "fences" and weather stations. However, much of the country is still remote and costly to reach, although certain widely scattered settlements are booming and it is no longer necessary for anyone with a yen for out-of-the-way places to undergo the hardships of an explorer to visit them.

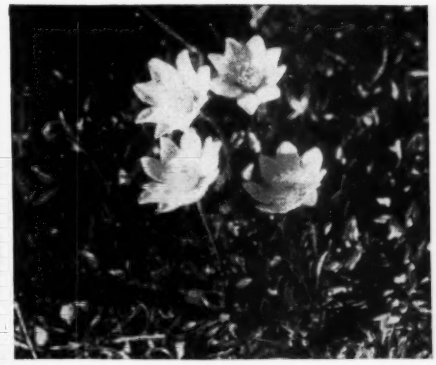
One of these, the busy little outpost of Churchill on the southwest rim of Hudson Bay some five hundred miles below the Arctic Circle, is relatively accessible for the average vacation. Although the harbor is open and free from ice for only a few summer months, rail service is continuous the year round. Churchill is unlikely to become a tourist center, but it offers much that is novel for the person with an interest in nature and tundra land. Like most frontier settlements, Churchill is a community of contrasts. A huge modern grain elevator dominates the landscape. Taxis speed along the miles of dusty road to the new self-contained military base. On the fringes of the village large families of Indians with their sled dogs camp during the summer, and on the river Eskimos harpoon white whales from outboard motor propelled canoes. Here at 58° north latitude the summers are short, but the long days of brilliant sunshine during June and July bring a great profusion and variety of wild flowers that lend color to the rocky coastline and windswept treeless tundra.

In planning our vacation trip to Churchill, Mrs. Shannon and I uncovered considerable popular information on the varied bird life but little describing the flora of this fringe area of the sub-Arctic. Our nine-day visit during early July was far too brief to permit more than a glimpse of the extensive natural life of that sector of the vast wild barrenlands. However, with unusually good weather for such a northern clime, the countryside was fairly well scoured on our daily field trips.

It was unnecessary to go far for unusual birds and wild flowers. In the yard of the radio station, undisturbed by children at play, Hoyt's horned lark was brooding its young amid a great profusion of the lovely creamy white blossoms of the Arctic avens *(Dryas integrifolia)* and the brilliant purplish-flowered *Hedysarum Mackenzii*. Another common but less colorful member of the Pulse family was the Arctic milk-vetch *(Astragalus alpinus)*. We were fortunate in finding a plant of this species in its rare white form. In the cinders of a railroad embankment, an Arctic tern had scooped out its shallow nest near a patch of flamboyant broad-leaved fireweed *(Epilobium latifolium)*. The northern Indian paint-brush *(Castilleja septentrionalis)* brightened the village roadsides with gay color ranging from scarlet to pearly gray. On the Common in front of the all-important Hudson Bay Company store, *Arnica alpina* added its touch of dusty yellow to the lush gold of the many-headed marsh-fleabane *(Senecio congestus* var. *palustris)* around the townsite sloughs.

One of our favorite walks was along the bay where a low ridge of Pre-Cambrian granite, rounded and planed by glaciers, stretched eastward unbroken

Rhododendron lapponicum



Dryas integrifolia

Salix reticulata

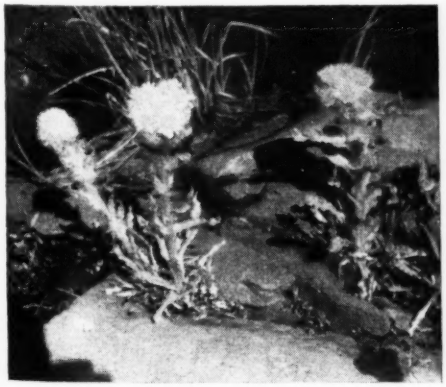
for miles. Here among the lichen-encrusted rocks the plovers lay their eggs in exposed nests. This was also the hunting ground of a snowy owl in intermediate plumage that resented our intrusion. Among these same rocks a great variety of plant life finds limited protection. Dwarf mats of the delicately scented rose-pink Lapland rosebay *(Rhododendron lapponicum)* vie with the ornamental white flower clusters of two species of Labrador tea. The narrow-leaved *Ledum decumbens* is more abundant in this district. Other heaths, more beneficial in season to man and bird, are the alpine bilberry *(Vaccinium uliginosum* var. *alpinum),* bearberry *(Arctostaphylos rubra)* and cranberry *(Vaccinium Vitis-idaea* var. *minus).* Black crowberry *(Empetrum nigrum)* and soapberry *(Shepherdia canadensis)* also serve as a source of food for the birds. Many dainty little flowers find root in the rock crevices including several species of saxifrages, anemones, and primroses. The fabled "rock breakers" were represented by quantities of *Saxifraga tricuspidata* and a few specimens of its tiny relative, *Saxifraga rivularis;* the wind-flowers by the delicate white *Anemone parviflora* and the frail and uncommon golden-flowered *Anemone Richardsoni.* The white, pink, and lilac blooms of the yellow-eyed *Primula mistassinica* were much more conspicuous amid the shore boulders than the miniature red-stemmed *Androsace septentrionalis* of the same family. Of particular interest was a white-flowered campion only recently named as *Lychnis Gillettii.*

On the shore at tide-line, in pockets of sand among grotesquely shaped ice-floes, the northern lungwort *(Mertensia maritima)* shared its bleak habitat with a northern variety of the ubiquitous seabeach sandwort *(Arenaria peploides).*

Perhaps the most exciting of our nature rambles were those on the vast open tundra just beyond town. The land is level and appears barren and empty; yet the surface is a mat of vegetation, except where rocks break through or innumerable pools drown it. A distinctive characteristic of the tundra is permafrost, which here reaches its southernmost limit. Each summer the surface muskeg thaws a few inches, permitting the growth of arctic vegetation. This limited thaw does not penetrate deep enough to encourage roots of trees except for a few specialized forms, nor does it go deep enough to allow efficient drainage. Hence, most of the precipitation is trapped in countless lakes and ponds in which myriads of mosquitoes breed. Their numbers and ferocity cannot be exaggerated, but frequent and liberal applications of repellents made them endurable.

On the windswept barrens the delicate pink blossoms of the wild rosemary *(Andromeda polifolia)* and alpine azalea *(Loiseleuria procumbens)* were fading, but their places were rapidly being taken by others, such as *Pyrola rotundifolia* var. *americana;* several species of lousewort, the most colorful of which were the red-tipped *Pedicularis flammea* and the straw-yellow *P. Lapponica,* and alpine bistort *(Polygonum viviparum).* True natives of the north country, whose excellent fruit is eagerly sought for in season, are the Arctic raspberry *(Rubus arcticus)* and baked-appleberry *(Rubus Chamaemorus),* both of which grow here abundantly. Another edible

(Continued on page 121)



Senecio congestus var. *palustris*

Rubus arcticus

Cypripedium passerinum

The Ida Cason Callaway Gardens

By **Fred C. Galle**

Waterfalls on the Native Azalea and Wild Flower Trail.

"THE Twentieth Century Garden of Eden" has been used to describe the twenty-five hundred acre garden and recreation center, known to over half a million people who have visited the Ida Cason Callaway Gardens since they were opened in 1952.

The Gardens were established by Cason J. Callaway, Georgia industrialist, as a sanctuary for the native plants and wild flowers of the Appalachian Mountains. The Gardens are a living, unfinished monument in memory of his mother, Ida Cason Callaway, and an effort is being made to develop them in such a way that they will be a help and inspiration to all those who visit them. The Gardens are being developed and maintained by the Ida Cason Callaway Foundation, as a non-profit, but self-sustaining project.

The Gardens are located in the west central part of Georgia on U.S. Highway No. 27, two miles south of Chipley, eighty-five miles south of Atlanta, thirty miles north of Columbus, and only sixteen miles east of the Little White House of the late President Franklin D. Roosevelt. The Gardens contain eleven man-made lakes, over nine miles of paved, scenic drive, numerous flower trails, facilities for boating, fishing, swimming, golfing, and picnicking; a new paradise for people of all ages.

Horticulturally, the Gardens are in their formative stages, but each year additional plants are showing forth colorful flowers after becoming permanently established. The planting plans have a two-fold purpose. First, to offer a pleasing sight to the eye as one travels along the "Five Mile Drive" or takes a trip in "Cleopatra's Barge" on Mountain Creek Lake or spends a day at Robin Lake. Second, to provide for posterity a repository for the native plants of the Appalachian Mountains. Ornamental or introduced plants are used at Robin Lake Beach and also in entrance plantings and other designated areas, such as the Club House Area, greenhouse, and on some of the walking trails in Meadowlark Flower Area.

The major plantings are of native plants, many grown in the Garden's greenhouse and nursery, and others are collected and permanently planted. In general, native plant materials, such as azaleas and mountain-laurel, are cut back to the ground when planted. New growth develops into a well-formed plant, which usually starts blooming the second year after being cut back. Thus, each year previously planted areas begin to show forth with a splash of color.

The large pine-wooded areas along the drives near the Club House Area are planted with ornamental azaleas, mainly Kurume and indica types at the present. Other azaleas, such as Glen Dales, Deerfield, and Beltsville Hybrids, are being grown for future planting within this area. As a second story planting over the azaleas and still beneath the pines are numerous flowering dogwoods. A collection of other species of *Cornus* are being used in this area.

A crabapple planting has been established in front of the Club House. Many of these plants have been established for three years, while others are of more recent setting. The crabapple collection includes forty-three named varieties with at least three of each type being used and, in some cases, as many as a dozen plants of a variety are found.

Driving through the Gardens, you pass small spring-fed lakes, each with a bird name; Mockingbird, Whippoorwill, Bobolink, Bluebird, and Hum-

Lower view of The Azalea and Wild Flower Trail. Water-lilies will be featured in the lake this season.

Natural woodland setting for American Holly Trail No. 1.

mingbird. Each lake overflows, eventually, into Mountain Creek Lake. The drive also takes you through rich mixed pine and hardwood forest of loblolly, short-leaf pine, oak, maple, sweet gum, and black gum. The areas also contain numerous secondary trees such as dogwood, redbud, wild sweet crabapple, sourwood, serviceberry, silverbell, and American holly. Large mass planting of various native plants become obvious during the flowering season; such plantings now consist of Piedmont, Oconee, flame, plumleaf, sweet and pinkshell azaleas, mountain-laurel, rosebay rhododendron, oakleaf hydrangea, wild plum, hypericum, sweet shrub, sparkleberry, wax-myrtle, numerous holly species, and other plants.

Approximately two and one-half miles along the drive a road branches off to the greenhouse, lathhouses, and nursery area. Here are extensive plant propagation and cutting bed areas, where native and ornamental plants are being rooted and grown on for future planting in the Gardens. Cut flowers and foliage materials are also grown for use in the Club House and various offices within the Gardens. While the greenhouse and nursery are primarily working areas, many visitors find it a fascinating place to observe the newer methods of plant propagation and the collection of unusual plant materials for this section of the country.

Driving along the main road, one approaches Meadowlark Flower Area with more than two miles of walking trails where specimen plants are permanently marked for quick identification. The Meadowlark Area is fast becoming recognized as an ideal outdoor laboratory for students of high schools, colleges, and garden clubbers. College groups from Georgia, Alabama, and Louisiana are already visiting the Gardens regularly as part of their class work. To extend this interest to students of plants all over the United States is one of the many aims of the Ida Cason Callaway Gardens.

The Azalea and Wild Flower Trail is one of the loveliest of all in season and will eventually contain all obtainable native azaleas or deciduous rhododendrons. Beautiful at all times, the appeal of the Trail is irresistible in the Spring, when the dogwood and Piedmont azalea, *Rhododendron canescens,* are in full glory. This floral display normally starts in late March and extends into April. Other early Spring-flowering native azaleas are the yellow-flowered *Rhododendron austrinum* (Florida azalea), the pink to white *Rhododendron nudiflorum,* (pinxter-bloom azalea) and the pink-flowered *Rhododendron roseum* (roseshell azalea). In April, the coral-pink to orange-red flowers of *Rhododendron speciosum* (Oconee azalea) take over, followed by the fragrant white to pink flowers of *Rhododendron alabamensis* (Alabama azalea.) Mountain-laurel and other native evergreen rhododendrons come into bloom during the Spring season. In late April and May, the yellow to orange-red flowers of *Rhododendron calendulaceum* (flame azalea) appear along with other species in this same alliance, such as *Rhododendron cumberlandense, Bakeri,* and *Furbishi.*

The rarest of the native rhododendron species on the Trail is *Rhododendron prunifolium* (plumleaf azalea).

Path along the parking area near the Holly Trails in Meadowlark Flower Area.

West Beach Area—as the visitor paddles his canoe or pedals his bicycle boat from Chickadee Lake through Kingfisher Canal to Martin Lake, he views the plantings along the shore line.

Two large mass plantings of this late summer orange to brick-red flowering shrub show forth in mid-July and August. In 1946, Mr. Callaway received the Frances K. Hutchinson Medal for conservation from the Garden Club of America for his interest and work in the preservation and perpetuation of this rare species. Flowering with the plumleaf azalea is the fragrant, white-flowered sweet azalea, *Rhododendron arborescens.*

Other azaleas flowering during the spring and summer include *Rhododendron canadense* (rhodora), *Rhododendron atlanticum* (coast azalea), *Rhododendron viscosum* (swamp azalea), and *Rhododendron serrulatum* (hammock-sweet azalea). In addition to the azaleas on the Trail, numerous other native plants are planted out for quick identification for the "nature lover." To add interest during the summer, this year both native and tropical waterlilies will be in use in two small pools on the inlet of Mountain Creek Lake. The Trail follows close to the water in many areas and offers good vistas of the flowering water-lilies.

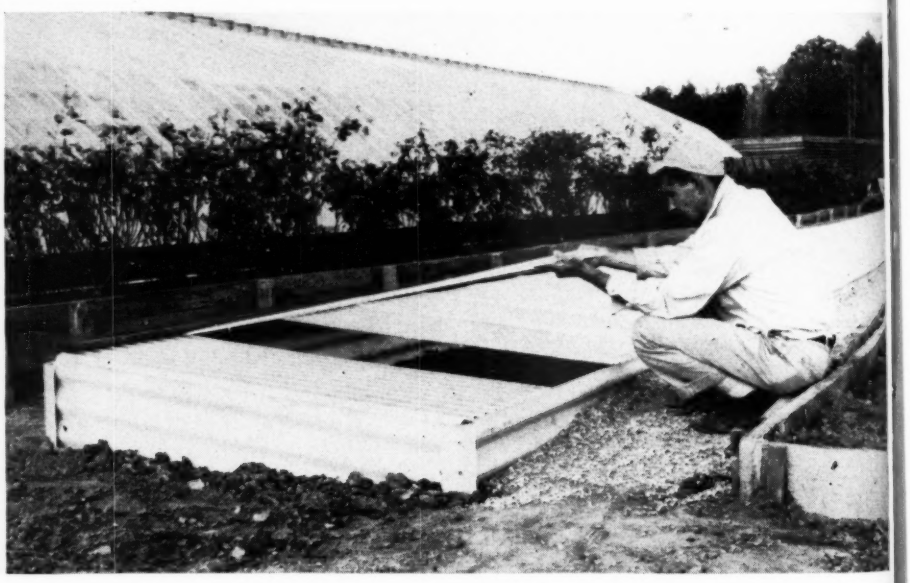
Five Holly Trails are also found in the Meadowlark Area, planted with English, Oriental, and American Holly species and varieties. Eventually, it is planned to have all species and varieties of *Ilex* that will survive in this climate. Many of the small specimen holly plants are being grown in the lath houses and nursery for future placement on the Trails. The collection already consists of over thirty species and totals over two hundred and seventy named varieties or types and will become one of the leading areas for the student or holly enthusiast.

To extend the trails, a large circular area was developed called Upper Meadowlark Flower Area. In this area, the Magnolia Arboretum, the Hybrid Rhododendron Trail, and the Bird Study Trail were added.

The magnolia collection at present lists forty-five species or varieties. The Oriental species and varieties are in the open around the parking area, while the native magnolias are planted along the Rhododendron Trail. The yellow cucumber tree *(Magnolia cordata)* is featured in several plantings along the Trail. Most of the magnolias had to be obtained as small plants; but as time passes, the Magnolia Arboretum will develop into a spring and summer wonderland.

The Hybrid Rhododendron Trail, laid out in the winter of 1955, is the first trail of its kind in the Southeast. Many colorful hybrid plants have been assembled for several previous years for this trail. Maximum care and attention are given to this group of plants, and the trail is equipped with a permanent irrigation system. The trail, while attractive at all times, is colorfully so from mid-April through May and, as most gardeners know, only time again is necessary for these plants to develop into their picturesque and colorful massive forms. As might be expected, not all rhododendron hybrids will do well in this southern area; but, through trial and testing of a large list of varieties, we hope many will become permanently established and show forth with beauty for years to come.

The Bird Study Trail was developed for the many bird lovers who expressed a desire for a secluded area to study birds. In conjunction with the formal opening of this trail in April 1955, the entire Gardens were declared a bird sanctuary. The Bird Study Trail branches off from the Rhododendron Trail and goes through a mixed pine and hardwood forest around Hummingbird Lake and returns alongside an open meadow. Fruiting shrubs, feeding stations, and observation benches are found along the Trail. More than one hundred and forty different birds have been identified during a single season in the Gardens and, with the many lakes, it is



Ben Pace, greenhouse foreman, checking transite constructed coldframes—maxlite "85" corrulux used as sash.

rapidly becoming a winter home for many migratory ducks and geese.

The Club House and other buildings within the Gardens are of seventeenth century English provincial architecture. The Club House, open to the public, has a beautiful large dining room and a long, restful porch overlooking the one hundred and seventy-five acre Mountain Creek Lake. Downstairs are locker rooms and the golf shop. The nine-hole golf course begins and ends at the Club House, the fairways skirting around Mountain Creek Lake.

Nearby is the big, semi-circular boat house with a hundred fishing boats available. Also available for hire are two house boats, "Lake Liner," and a larger craft, "Cleopatra's Barge," for touring the shore line of Mountain Creek Lake. High on a slope, just north of the Club House, is "Overlook," a restful picnic area for individual families or large groups. Parking facilities, rest rooms, and a large semi-circular picnic shelter overlook the Club House, the boat house, and Mountain Creek Lake.

Robin Lake, the second largest lake in the Gardens, is the center of summer water recreation—swimming, sun bathing, speed boating, and water skiing. The white sand beach is fifty feet wide and extends one hundred and twenty feet into the water, covering over one-half-mile around Robin Lake shore line. There are three open-roofed bath houses, each accommodating a thousand bathers. Each dressing area surrounds flower beds, and colorful flower beds are planted around the outside of each building. There are prominent tree-planted parking areas adjacent to each bath house. Around the lake are numerous picnic areas, which will accommodate twenty-five hundred people.

Near Robin Lake are two small bicycle boat and canoe lakes, Lake Chickadee and Martin, which are connected by a quarter-mile, twenty-five foot wide Kingfisher Canal. Overlooking Chickadee Lake, along the shore line and through gentle hills, rides a miniature train with a round trip of approximately one and one-half miles.

The planting plan of the Beach Area emphasizes summer bloom, and various-colored crepe-myrtles, oak-leaf hydrangeas, hydrangea P.G., floribunda roses, day-lilies and hibiscus, along with other

(continued on inside back cover)

Know What to Do

July and August

IF THERE IS A dry spell of weather, lawns and gardens will require watering in order to maintain life and growth of grass, plants, and vegetables. The new plastic soil soakers, with perforations on one side only, are excellent for this job. They can be placed with the perforated side down between lines of plants to soak the ground without wetting the foliage. This is a very important feature in watering the rose garden especially if it is necessary to do the watering late in the day. On the lawn, keep the perforated side up to cover as large an area as possible. A good soaking once a week is much better than two or three light sprinkles, and evening is the best time of the day for watering the lawn.

In the vegetable garden, plantings of cabbage, broccoli, and celery should be made the first week in July. Celery does best if planted in trenches which have a three or four-inch layer of rotted cow manure covered with approximately three inches of topsoil. Celery requires plenty of water during dry spells. Rutabaga for winter use should be sown early in July, also carrots and beets. Carrot 'Imperator' and beet 'Perfected Detroit' are excellent keepers.

Lettuce will not do as well during hot weather, but some varieties will grow; try 'Imperial 44' for heading and 'Oakleaf' for loose leaves.

Late sowings of sweet corn should be made the first week in July or about eighty to ninety days, depending on varieties to be grown, before the first frost is expected. Snap beans, bush varieties, take fifty-five to sixty days to mature — bear this in mind when making late sowings.

Tomatoes, if grown on stakes, will have to be tied every ten days. A mulch of salt hay, saved from winter covering, placed around the plants helps to conserve the moisture content of the soil during hot weather; grass clippings also can be used for mulching. Dust or spray tomatoes every ten days with a copper and rotenone combination to prevent blight and control pests.

Cultivate the vegetable garden frequently to keep down weeds and conserve moisture. Hill up corn, beans, cabbage, and broccoli to keep them erect.

Seeds of foxglove, Canterbury bells and Sweet William, if not sown late in June, must be sown early in July so that plants can be grown on for planting in the fall where they are going to bloom. Pansy, viola, and myosotis seeds should be sown about July 15 in a cool place. Seeds of many perennial plants can be sown in July. Seeds sown during warm weather should be watched carefully to be sure that they do not dry out. If seeds are sown in flats, they can be kept in the garage or basement until germination takes place, then be moved out to the light.

Iris can be divided and replanted any time after blooming. Tall-growing perennial plants should be staked, also tall annuals—do this work before plants fall down. As soon as the early flowering varieties of perennial phlox have finished blooming, remove the old flowers; this will encourage the plants to bloom again.

Cut off all flowers from the climbing roses after they have faded. Hybrid tea roses can be cut back a little after the first flowers are past; an application of rose food at this time will prove beneficial.

Pinch back chrysanthemums to make them bush out; and pinch the tops out of dahlias, when about eighteen inches high.

Cut out old canes from raspberries when finished fruiting; the ever-bearing varieties will bear fruit on the tips of the new canes in September.

Strawberry beds should have the straw or hay mulching removed after the fruit season has passed, especially if you want to get runners rooted for making a new bed. Late August is the time for planting a new strawberry bed. As a rule strawberries deteriorate after their second or third year; a good plan to follow is to do away with a third of the bed each year, making a new planting every year in a fresh site, with fresh runners so that no plants become more than three years old.

Keep insects and disease under con-

trol in the vegetable and flower gardens with a regular spraying or dusting schedule. Azaleas, rhododendrons, and mountain-laurel can be kept free from insects by spraying with malathion; follow instructions on the container. Red spider can do considerable damage late in July and August, if the weather is hot and dry. Spider mites are difficult to find, but damage done by the mites is easily recognized especially on boxwood and hemlock. Affected boxwood leaves turn a pale green or greyish color and hemlock becomes a blotched yellow color. Good control of mites can be had by spraying with "Aramite;" two applications will probably be required.

Madonna lilies should be ordered during August for delivery as soon as available. Planted in groups in front of delphiniums, they make a pleasing display. Plant the bulbs as soon as possible after you receive them. If the bulbs cannot be planted where you want them to bloom at the time of delivery, pot them in six or seven-inch pots, place them in a coldframe and keep them dark until growth starts, then remove covers. Bulbs intended for replacements in old plantings or to enlarge existing groups should be grown on in pots until those already in the garden are showing growth. This system eliminates guesswork. When you plant these bulbs, do not cover them more than two and a half inches. Bulbs for fall planting should be ordered now; be sure to look over the lists of miniature narcissi, botanical tulips, and other small bulbs in fall bulb catalogs under "Hardy Bulbs and Roots" and include them in your bulb order. They add grace to any border planting and to the rock garden. A planting of *Anemone blanda* in bloom will be long remembered.

Prune shade trees, also fruit trees that are growing too low over driveways or lawns.

Late August is a good time to make a new lawn. Grass seed sown at this time will be well established and deep rooted before heavy frosts arrive. When seeding is done too late in the fall, the grass roots do not go down deep enough, and alternate freezing and thawing heave them up, then the work has to be done over again in the spring. If you are planning to make a new lawn, start preparing the ground well in advance of seeding time. There should be at least five to six inches of good topsoil with a generous amount of well-rotted cow manure incorporated. Leaf compost is a satisfactory substitute when cow manure is not readily available, provided a dressing of lime is applied. Lime need not be added with the cow manure, unless a soil test indicates that it is required. The rototiller does a much better job of mixing soil and manure or compost than by hand with a spade or fork, but in either case the ground should be left to settle for about two weeks.

To prepare the lawn area for seeding, apply one half inch of humus plus a good lawn fertilizer at the rate of four pounds per one hundred square feet, work this in well with a cultivator —or with the rototiller, set for three inches deep, if the area is large. For a smooth even lawn, the area will have to be raked and rolled alternately until no low spots show. It is then given a light rake and is ready for seeding. The grass seed should be the best—it will prove least expensive in the end. 'Merion Blue' makes a beautiful lawn. It is expensive, yes, but like all higher-priced seed gives better coverage per pound. Seeds may be sown by hand or with a fertilizer spreader. Sow half the quantity required in one direction and the other half at right angles to the first. To cover the seeds I recommend a Diston spring action rake held lightly in hand, as you walk back and forth over the area. Roll with a light roller, then water with a fine rose nozzle. To prevent seeds from being washed out by heavy rains on terraces or steep sloping lawns, spread salt hay evenly over the seeded area. After the seeds have germinated and the grass is about one half inch tall, remove most of the hay. When seeding lawn must be done in warm dry weather, results will be better if salt hay is used to keep moisture in the ground.

—James M. Gibb

ROSES IN ENGLAND **(from page 107)**

latest hybrid teas and floribundas.

Plants are so arranged as to repeat, if possible, the natural cross-fertilization which resulted in the early garden hybrids. Experimentally, it is sought to discover how the earlier garden roses came to be.

The rose gardens at the John Innes Institution are a vast living herbarium, probably the most extensive and authentic in the world, an illustrative and experimentally verifiable collection. It has already enabled experts like Miss Ann P. Wylie to supplement the work of Dr. C. C. Hurst (the associate of Dr. Bateson) in his "Notes on The Origin and Evolution of Our Garden Roses" (Journal of the R.H.S., 1941, March, July, and August). Miss Wylie's articles have been republished in several recent numbers of "The Rose Magazine" of The American Rose Society.

Mr. Rowley has summarized the value of these extraordinary rose collections in relation to the cytological (or cell structure) research which is carried on at this institution. He says that such research is important: "1. in detecting hybridity, 2. in suggesting the possible parentage of hybrids, 3. in correcting mistaken identification, 4. in tracing geneologies of garden roses, and 5. *in directing the course of future rose breeding.*" This is the scientific exploratory road which should be followed in trying to develop the best garden roses, instead of hectic hit-or-miss crossing and back-crossing which so often ends in confusion, and may end in disaster for the rose.

IRIS **(from page 113)**

tologist of the New York State College of Agriculture. There were nineteen diseased clumps, which were all we could find with definite scorch symptoms in some two or three acres of irises. No nematodes were found in the roots of any of the nineteen diseased plants with dead leaves that had a scorched appearance and roots that were hollow and disintegrating from the scorch disease. We interpret this to mean that parasitic nematodes are not the cause of scorch in our garden. But this does not mean that in other gardens under other growing conditions scorch-like symptoms might not develop as a result of nematode infection.

Having referred to the root knot nematode as parasitic, I should like to describe briefly an experiment which demonstrated that healthy, disease-free iris plants may become infected with nematodes when grown in proximity to diseased plants. For this experiment Mr. Benson very kindly sent me an additional shipment of diseased rhizomes which were planted in large pots in the greenhouse. We then selected a

dozen of these potted plants which were making some top growth and had root knot injury. In each of the pots together with the diseased plant we placed from three to five healthy young iris seedlings. These seedlings were definitely known not to be infected with nematodes or, for that matter, with any other organisms, since they had been grown from seed by the excised embryo culture technique [as described by L. F. and Fannie R. Randolph in the October 1955 A.I.S. Bulletin] and were transferred directly to the pots from the sterile culture medium in which they had been growing.

Within two to three months root knots and inhibited root growth caused by nematode infection were clearly evident in more than half of the seedlings that had been planted with the diseased rhizomes from Mr. Benson's garden. However, most of these diseased seedlings had made fairly good growth and only a few of them showed any appreciable amount of foliage injury. This injury consisted of a browning of the tips of the leaves similar to that illustrated in the photographs of diseased plants published by Dr. Hannon in the April 1955 A.I.S. Bulletin.

In our experience the root knot nematode has not caused pronounced scorch symptoms to develop, but it *has* inhibited root growth very appreciably. Therefore, it seems not unlikely that if such diseased plants were exposed to the bright hot sunshine of the Southwest day after day or to other conditions of soil and climate unfavorable to iris culture they might develop pronounced foliage injury and succumb to the disease.

Faced with the problem of getting rid of the nematode infection in valuable plants we had collected in Europe, the hot water treatment known to be effective in eliminating root knot of peony was tried and found too harmful. Immersion in hot water at a temperature of 119° to 121°F. for thirty minutes after pretreatment for fifteen to twenty minutes at 100°F., as prescribed for peonies, injured the shoot tissue and killed or severly retarded the growth of rhizomes that were essentially dormant when treated. We then tried the rather drastic procedure of shearing off with a sharp knife all of the fibrous roots close to the rhizome. After this was done and the bare rhizomes had been thoroughly scrubbed in running water to get rid of any adhering eggs, cysts or adult nematodes, they were replanted and kept under favorable conditions for growth while new roots were being formed.

This procedure has effectively cleaned up most of our diseased stock without any losses of plants treated in this manner. Apparently the root knot nematode infects only the fibrous roots and rarely enters the rhizome. However, it does survive shipment over long distances, as proven by our European experience and by the fact that plants grown from thoroughly dried rhizomes shipped to us from the Southwest were diseased. Precautions should be taken to prevent spread of the disease by shipment of infected plants.

ARCTIC TUNDRA **(from page 115)**

fruit is the northern gooseberry *(Ribes oxyacanthoides)* which in this bleak territory spreads its branches flat along the ground. On the arctic prairie the willows are also reduced to prostrate dwarfs, yet they bear full-sized catkins and provide food and shelter for many birds. Of the species observed, *Salix reticulata* and *Salix Arctica* var. *Kophophylla* were easiest to identify. Where the tundra is soggiest, the cotton-grasses dominate the landscape, waving their silky tassels, and with them were the earlier flowering sweet coltsfoot *(Petasites sagittatus)* which for rapid growth has no equal in this locality. It is said that its thick hollow stalk sometimes attains a height of several feet within a few days, as it hastens on to maturity.

Everywhere were birds and flowers, but the animals seemed limited to the numerous scurrying mouse-like lemmings.

A few miles south from the bay isolated fingers of forest reached out into the tundra—small gnarled wind-tossed black spruce mixed with tamarack. This was the northern limit of the tree line and here among the thin clumps of trees, with a pair of Hudsonian curlews yelping in agitation nearby, we met a different type of plant and bird life. Topping our list of wild flowers for the area were the orchids—the lovely white Franklin's lady-slipper *(Cypripedium passerinum)* named for a great Canadian explorer; the hardy *Orchis rotundifolia,* and *Habenaria hyperborea* and *obtusata.* No less interesting was a small false asphodel *(Tofieldia borealis)* and a member of the Sandlewood family, *Geocaulon lividum* or northern comandra, whose juicy orange fruit is known locally as salmon berries. *Bartsia alpina* with its striking deep purple corolla was not yet in full bloom. In the damp humus of the open forest the butterworts flourished. We found only *Pinguicula vulgaris,* although *P. villosa* also is reported. Here, too, were solid acres of reindeer moss, hereabouts called caribou moss. Clusters of grass-of-Parnassus *(Parnassia Kotzebuei)* chose a damp but more stony environment. Returning to town from the forest along the gravel roadside, void of other plant life, we came upon a peculiar and never abundant dark yellow-flowered bladder-pod *(Lesquerella arctica).* Back on the rock ridge Arctic daisies *(Chrysanthemum arcticum)* were beginning to unfold.

In all some eighty plant species of the Churchill region were observed, and many of these photographed. Fascinating as this was, our visit was not entirely devoted to botany and bird study. There were also trips to the whaling factory, an inspection of the grain elevator, and excursions to the ruins of ancient Fort Prince of Wales, captured and sacked by the French in 1792, and to its modern counterpart, Fort Churchill, manned jointly by Canadians and Americans.

One of the enjoyable experiences was the short radiant Arctic nights—not nights such as we know them, but a strange combination of prolonged sunset and dawn, worth traveling thousands of miles to witness. The brilliant glow of the northern twilight lingered long after midnight, and at this time of year the sun came up again before three.

All too soon the vacation was over, and we found ourselves heading south on the Canadian National's "Muskeg Special," with a feeling that this had been only an introduction to the far north and some day we must return to the barrenlands.

"Cedar Grove" was originally built in 1726 as a primitive plantation house, a temporary resting place when farm affairs brought members of the family from the city to the farm. It was developed into a county seat by successive generations of the Morris family; and in 1926 the last owner, Lydia Morris, moved the house, with all its furnishings, from Wallingford, Pa., to Fairmount Park, Philadelphia. "Cedar Grove" is unique in that the house and furnishings have been kept intact for more than two and a quarter centuries.

"Woodford Mansion"—the lower first floor, front section, built originally by Thomas Shute as a simple farm dwelling in 1734—assumed proportions of dignity and style when enlarged by William Coleman in 1756. "Woodford" is now furnished completely in eighteenth century style and administered by the Naomi Wood Estate. Woodford Mansion is in East Fairmount Park, Philadelphia.

Spring 1956
GARDEN TOUR

The New York Botanical Garden, on its Spring 1956 Garden Tour, visited the house and gardens of John Bartram, the famous Colonial botanist, and four historic homes in Fairmount Park, Philadelphia. These charming homes are illustrated and briefly described on these pages; they must be seen to be fully appreciated—and they are well worth a trip to Philadelphia.

The tour was well organized to every last detail by the Spring Garden Tour Committee of the Volunteer Associates, with Mrs. Herman D. Ruhm, Jr., and Mrs. Henry M. Watts, Jr., serving as co-chairmen.

At the Bartram garden, Dr. John C. Wister, President of the John Bartram Foundation, spoke briefly on the restoration of the house and garden; at "Strawberry Mansion," Mrs. E. Florens Rivinus, Chairman of the Women's Committee of 1926, gave a very amusing account of the history and restoration of that property.

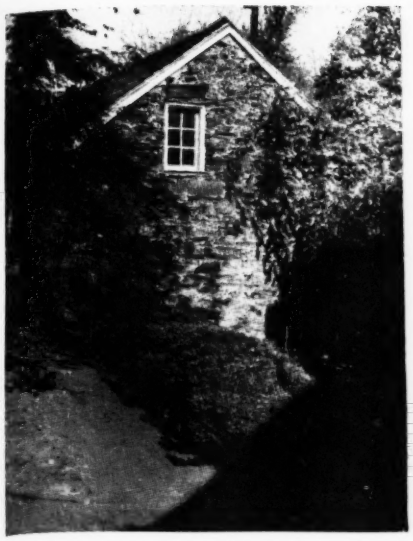
T. H. Everett, Curator of Education and Horticulturist of The New York Botanical Garden, prepared an account of "John Bartram and His Garden" for use on the tour, from which the following excerpts are reprinted:—

A farmer, "a plain unlettered man," established America's first botanic garden two and a quarter centuries ago. That garden and its founder had a profound effect upon the development of botany and gardening both in the New World and the Old.

John Bartram was born in 1699. His interest in plants was awakened as a young man. He hired a schoolmaster to teach him Latin and bought what books he could on botany. He studied the plants of his place and neighborhood and soon ranged wider afield searching out the native plants of eastern North America, a veritable treasure house of handsome and interesting species. His early travels took him into Maryland, New Jersey, and to the Blue Mountains of Pennsylvania.

Following the death of his first wife and the taking of a second two years later in 1729, John Bartram's travels took him yet farther from home. He followed the Schuylkill River to its source; he visited in the region of Syracuse, New York; he traveled through the Shenandoah Valley and the nearby mountains. On one occasion he traveled 1,100 miles in five weeks, no mean achievement in those days.

Many trees and shrubs native to America were first seen in European gardens as a result of the efforts of John Bartram, and many of those kinds that still grow in Europe are lineal descendents (propagations by cuttings, layers, grafts, and seeds) of Bartram's original introductions. Among the plants that Bartram sent to England were bittersweet, skunk-cabbage, Mayflower,



John Bartram built the "seed house" with his own hands about 1730, in which to store his seeds, minerals, and curiosities. He also used it as a greenhouse until 1760.

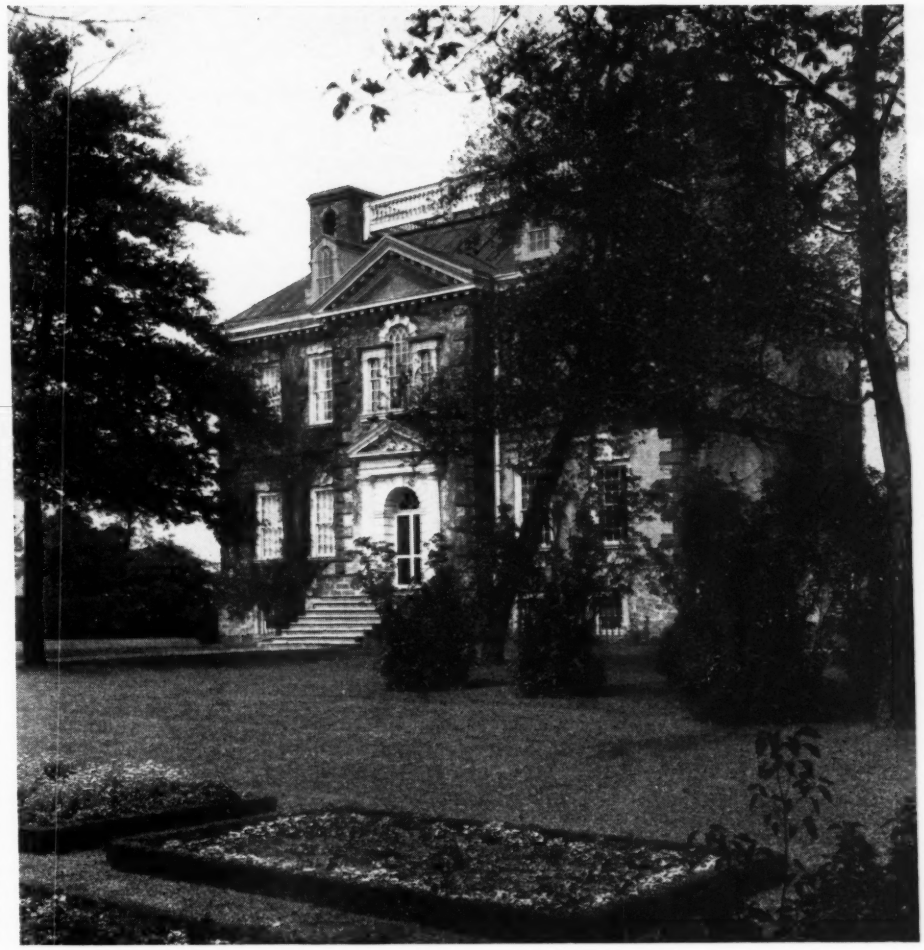
rhododendron, swamp honeysuckle, cucumber-tree, mountain-laurel, arrowwood, winterberry, staggerbush, river birch, hemlock, shooting-star, and ginseng.

A most notable discovery of Bartram's was *Gordonia (Franklinia) alatamaha* which he found in Georgia in 1760. Some years later his son, William Bartram, visited the locality again and brought home seeds to his father, then nearing the end of his life. The seeds grew and the plants resulting from them in turn produced seeds. From these have been derived all the specimens of *Gordonia alatamaha* in cultivation; the shrub has never been seen in the wild since William Bartram collected seed from it.

As a result of his early work John Bartram was appointed King's botanist to the King of England, an honor which carried with it a stipend that enabled him to expand his explorations and made possible a botanical expedition to Florida.

In restoring the garden, after it assumed custody in 1923, Fairmount Park Commission has made a great effort to limit the plants to those which were here in Bartram's lifetime.

(Continued on page 129)



"Mount Pleasant," built in 1761, is admirably situated on a bluff above the Schuylkill River. The old-fashioned English garden, surrounded by a wide lawn and bordered with lilacs, has been restored by the Planters' Garden Club. There are three terraces which descend to the river's bank; the first devoted to small beds of annuals, bordered by dwarf boxwood, the second to borders of perennials, and the third to a rose garden. All the flowers that would have been found in such a garden in Colonial days have been planted here.

"Somerton" was the home of Charles Thomson, Secretary of the Continental Congress; ransacked and burned by the British, the property was later acquired by Judge William Lewis who built the central portion of the present mansion in 1799. "Somerton" changed ownership and deteriorated, but the strawberry plants imported from Chile by one of the owners flourished; and strawberries and cream became a specialty when the place was operated as a restaurant. Hence, the present name of "Strawberry Mansion."

In 1931, the Women's Committee of 1926, which had built High Street for Philadelphia's Sesquicentennial, decided to restore "Strawberry Mansion" as an historical monument. The Committee of 1926 was headed by Mrs. J. Willis Martin, founder of the Garden Club of America, which has given a Memorial Path in her honor.

BOOK REVIEWS

ALICE EASTWOOD'S WONDERLAND. Carol Green Wilson. 222 pages. California Academy of Sciences, Golden Gate Park, San Francisco, Calif. 1955. $5

An attractive book with a neat sketch of a western plant above the heading of each chapter, this account of Alice Eastwood presents admirably her vitality and vigor and makes the reader feel the tremendous drive that maintained her until her retirement at the age of ninety. Despite discouragements, such as the loss of many years' work at the time of the fire and earthquake of 1906, Miss Eastwood was able through her own efforts, often with very little encouragement, to build a new library and herbarium and outstanding botanical center at the California Academy of Sciences. It took bravery and indefatigable effort to accomplish what she did. Yet during all these efforts she gave most generously of her time and of herself to innumerable friends and organizations and she encouraged many in their interest in her subject. Mrs. Wilson has made one feel all this and has done it in a delightful and readable way. She has taken her readers through much of the western United States, to Harvard and other eastern institutions, and to Europe, in a most realistic fashion. She has made Alice Eastwood live again for those who knew her and, I would certainly expect, created her as a real human being for those who did not.

Miss Eastwood's integrity, fundamental sincerity, and genuineness are constantly brought to the front. As a study of an interesting woman who has contributed much to our knowledge of western plants, this book is thoroughly worthwhile. Its judgments as to Miss Eastwood's status as the outstanding authority on some of these groups, like *Lupinus* and *Arctostaphylos*, are those of a journalist and do not necessarily coincide with the opinions of many botanists. The first three-fourths of the book are the most interesting and informative; they are based in large part on the reminiscences of Miss Eastwood herself as passed on to the author during the years before Miss Eastwood's death. They constitute altogether a fascinating account. The later portion of the volume is to me less interesting and for some reason has been much less carefully proofread, so that it contains a good many errors. I have to confess that finding these in the work of others always comforts me, since I so frequently meet them in my own.

I would say that anyone interested in the development of western botany, in the history of a brave and industrious woman, and in an inspiring account of a successful struggle against adversity, should own this entertaining and informative volume.

PHILIP A. MUNZ
Rancho Santa Ana Botanic Garden
Claremont, California

"UNUSUAL PLANTS"—110 SPECTACULAR PHOTOGRAPHS OF SUCCULENTS. J. R. Brown. 110 black and white plates with descriptive text. Abbey Garden Press, Pasadena, Calif. 1954. $4.50

To one not acquainted with the world of succulent plants this book comes as a revelation. The symmetry of perfect geometrical form is well exhibited in each photograph and should make the plant hobbyist's possessive instincts itch to own such satisfying beauty.

While making no botanical pretensions, the author has made of every plant an artistic masterpiece that gives the reader an esthetic uplift. To bring out of the hard, carved look of this type of plant such a feeling, required the eye of an artist and the ability of a first-rate photographer—and Mr. Brown qualifies as both—and also for those who are not acquainted with him, it should be said he is also a first-rate horticulturist.

Anyone interested in art in nature, as well as those who grow and love these plants, should wish to own this book.

E. J. ALEXANDER

CACTUS GUIDE. Ladislaus Cutak. 144 pages, illustrated, indexed. D. Van Nostrand, Princeton, N. J. 1956. $3.95

If one already has a fair amount of knowledge of cacti, and wishes only to have a friendly and chatty little book about his hobby, then this is a nice little book for his purpose. If, on the other hand, one is seeking for information on the subject, this book is sadly lacking in everything except propagation, and disease and pest control, and even there the information is not up to date, for there are on the market today several more effective insecticides than those which Mr. Cutak recommends.

In view of the space given to descriptions of plants, too much attention is given to a few groups of Mexican and southwestern U. S. cacti, and great groups of other Mexican and South American cacti, many of which are excellent and popular horticultural subjects, are passed over superficially.

There is entirely too much "I" in the book, and the price is too high for such a small book, illustrated only by line-drawings. From the conservation and plant-lovers viewpoint, the portrait on the inside back jacket is in very bad taste—it places Mr. Cutak in the category of those who set fire to Sahuaros and Joshua trees just to see them burn—a real plant-lover would not hack a large specimen plant in half just to have his picture taken eating a portion of the pulp.

E. J. ALEXANDER

FRUITS AND FLOWERS. Pierre-Joseph Redoute. 24 plates selected from "Choix des Plus Belles Fleurs et des Plus Beaux Fruits" with original preface by P. J. Redoute, edited and introduced by Eva Mannering. Crown Publishers, New York. 1956. $7.50

This lovely and luxurious volume, 12" x 16", has twenty-four exquisite reproductions from Redoute's "La Choix des Plus Belles Fleurs et des Plus Beaux Fruits" of 1827. The present plates were made and printed in Germany by K. G. Lohse, of Frankfurt am Main.

This choice of a choice well illustrates Redoute's hope that "I may have succeeded in the threefold combination of Accuracy, Composition, and the Art of Coloring." Indeed he has!

A very brief and pleasant introduction is offered by the editor, Eva Mannering, outlining the history of flower prints. A translation of Redoute's own preface to, presumably, the 1827 edition follows, flowery as his pictures.

A few explanatory notes are then given concerning each of the plates, tracing the derivation of names and origins of plants, with here and there a hint as to cultivation, intended for the English climate. (*Fruits and Flowers* was first published by the Ariel Press at London, 1955.)

If the notes are casual, and not very helpful for American conditions, the printing here and throughout the book is beyond cavil.

FANNY W. PARSONS
Rye, N. Y.

DRAWING TREES. Henry C. Pitz. 127 pages, illustrated. Watson Guptill Publications, New York. 1956. $5.75

Henry C. Pitz, Director, Department of Illustration, Philadelphia Museum School of Art, has written and illustrated a book entitled *Drawing Trees*. Highest craft standards are subscribed to. Mr. Pitz is a superb draughtsman, has profound knowledge of trees, and writes prose that is a joy to read. He proceeds logically from the whole of the problem to the parts, puts emphasis on the importance of learning to see in simple geometric equivalents, and adds a "gallery of examples" that his book did not need, but which adds enrichment.

To one familiar with the poetic imagination always present in this man's drawings of human characters his preface pointing the relationship between man and trees is in perfect concordance.

The qualities that make up an artist of stature are rare; if a man has them, he imprints them in his works. Mr. Pitz has these qualities and their imprint is in this book.

EDGAR A. WHITNEY
Jackson Heights, N. Y.

FLOWER PAINTING IN WATER COLOUR. Marcella Smith. 80 pages, illustrated in color and black and white; indexed. Pitman Publishing Corp., New York. 1956. (Printed in Great Britain.) $3.25

Flowers as subject matter for paintings wrinkle many contemporary noses. This reviewer cannot understand why. The status of the painters listed below, all of whom frequently chose this subject, should give pause to the minds behind the wrinkled noses.

Marcella Smith R. I., R. B. A.—and why her publisher, Pitman, does not list her credentials on his jacket is a mystery—has written a book titled *Flower Painting in Water Colour*. In Chapter I, the author states clearly that the book is for those uninitiated in the ways of flowers or the use of water color medium. For that group, the book serves a purpose, though it is to be regretted that there is not a more apparent pointing of objectives than a careful flower arrangement and then a transcriptive concept.

This flower painter wonders why the author feels the need of "at least ½ dozen #6 brushes." Much larger caligraphic marks add distinction to many of her paintings.

The text stresses the compatibility of the water color medium and flowers as subject matter, which is true—freshness, brightness, and softness being the chief characteristics of both.

There is much technical advice, even in-

Four Companion Books

HOW TO GROW BEAUTIFUL HOUSE PLANTS
THE FLOWER GARDEN GUIDE
THE GARDENING HANDBOOK
LAWNS AND LANDSCAPING HANDBOOK

by **T. H. EVERETT**
Curator of Education and Horticulturist

Price 85c Each, Postpaid

10% DISCOUNT
to members of
The New York Botanical Garden
on orders placed through

BOOK SERVICE
THE NEW YORK BOTANICAL GARDEN
Bronx Park, New York 58, N. Y.

cluding suggestions as to how to keep flowers fresh.

The author decries sameness in flower painting and then presents eighteen reproductions. In eighteen, the flowers are precisely in the center of the rectangle; in eighteen, the pot, vase or jar is precisely under the center of the flowers; in eighteen, the vase is the same distance from the bottom of the painting (within a fraction of an inch); in eighteen of the pictures the vase rests on a table; in seventeen of them the negative shapes behind the flowers are the same areas.

Surely a glance at the flower painting of Matthew Smith, Paul Cezanne, George Sheringham, Vincent Van Gogh, Barbara Christian, S. J. Peploe, August Renoir—to name a few—would indicate possibilities for variety and distinguished space divisions composed with flowers in a rectangle.

Technically, the paintings subscribe to best professional standards.

EDGAR A. WHITNEY
Jackson Heights, N. Y.

A GUIDE TO HOME LANDSCAPING. Donald J. Bushey. 293 pages, illustrated by the author; indexed. McGraw-Hill Book Co., New York. 1956. $4.95

Just as the title implies, this book is a guide for home owners in the development of the landscape possibilities of their properties. It is meat—lean meat with no bone, gristle, or fat waste. It is factual, brief, and surprisingly comprehensive for such a large subject condensed into a comparatively small book. It includes selecting the site; locating the house on the property; grading and drainage; driveways and sidewalk layouts; making new lawns and maintaining them; soil preparation; weed control; fertilizing and pruning; choice and planting of trees and shrubs; outdoor recreation and hobbies.

Each phase is simply and clearly explained with all sorts of aids and precautions worked into the suggestions. Such a complete handling of the subject matter could be possible only by a person of long experience.

The illustrations are both numerous and well chosen to keep the reader close to the text. As a further aid, the plant lists in the back of the book include phonetic spelling as an aid to pronunciation. This in itself is worth the price of the book to many who struggle with those long Latin names.

In summary, if it is impossible to have someone like Mr. Bushey to solve your landscape problems in person, this book is as adequate a substitute as one is likely to find.

ARTHUR F. MURPHY
Landscape Architect
N. Y. City Park Dept.

HOW TO LANDSCAPE YOUR OWN HOME. Robert S. Malkin. 432 pages, illustrated with 514 sketches by the author; indexed. Harper & Bros., New York. 1955. $4.95

This book is an excellent reference volume for the new home owner, as well as a good book for those who have had landscape experience and enjoy a knowledge of the subject.

It is well organized and written in the layman's language. The sequence of thought is good and follows from the original purchase of property, in fact, it has many helpful suggestions to the prospective land purchaser, to the location of the last bulb or annual.

The ideas are original and yet simple enough to be incorporated into almost anyone's problem. The materials suggested, as well as their use, are simple, common, and inexpensive, but used in a manner few of us would think of.

In this book, the approach to most landscape problems is that they may be performed by the layman with tools available in his own toolshed. This is a direct contrast to the popular belief that a professional is required for this type of work. Only the technical problems and those requiring heavy equipment should be performed by other than the home owner, and this book tells you how. Even the author's sketches are done for the layman and are readily read and understood.

In short, it is the type of book the public has needed for a long time, and it indeed fulfills this need very well.

DONALD F. POLLITT, *Pres.*
Landscape Associates, Inc.

HOW TO INSTALL AND CARE FOR YOUR LAWN. 64 pages, illustrated. Lane Publishing Co., Menlo Park, Calif. 1955. $1

Here is another of those wonderful Sunset Books published by "Sunset, the Magazine of Western Living." Although there is no question that a good deal of the material is strictly for West Coast consumption, there is, nevertheless, much information that the northeastern lawn enthusiast can learn from this handy paper-bound book.

In true "Sunset" fashion photographs and other illustrations are very well done and add immeasurably to the text.

The book is divided into four major sections: "Which is the lawn for you?" "Installing Your lawn;" "How to care for your lawn," and "Trees in lawns."

Sections covering the choices in seed lawns and an elaborate chart evaluating twenty-eight grasses are excellent. While interesting, the pages devoted to Bermuda and other tropical grasses, and *Dichondra* —a non-grass groundcover—used like white clover, are pretty much for warmer climates.

Except for timing differences the sections on installation, watering, mowing, weeding, fertilizing, and repairing and renovating are excellent. It is here also that the abundance of pictures and sketches add so much to the reader's benefit.

As might be expected the section on watering is quite elaborate and detailed. From types of watering patterns possible to the installation of a permanent sprinkler system, the subject is covered fully. The importance of irrigation where dry seasons are natural yearly occurrences is indeed well done. Details on installing a permanent sprinkler system are described completely, although I question the necessity and expense of these systems in the Northeast.

The ever-important topic of mowing is covered in detail. Here, again, pictures supplement the text wonderfully and show the various types of mowers and the type of job each does.

The section on weeding is highlighted by pictures of sixteen common lawn weeds, and again the text is thorough in describing the many chemical weed control materials available. Information on soil sterilants—where one is interested in "sterilizing" his ground to kill everything—weeds, weed seed, and disease organisms before putting in the lawn—is also included.

The special problem of trees in lawns is covered well from the cultural viewpoint—fertilizer competition and water relations, but the list of trees includes several that are completely out of the question in the Northeast. Also included is a list of trees that definitely shouldn't be planted in the lawn, such as Norway Maple, under which grass will not persist no matter what is

MEMBERS OF THE NEW YORK BOTANICAL GARDEN ENJOY . . .
— 10% DISCOUNT —
ON BOOK PRICES

AMERICAN GARDENERS BOOKS OF BULBS
by T. H. EVERETT, *Horticulturist*
Profusely illustrated in color
Price $5.95

WHAT'S NEW IN GARDENING?
Price $3.50

MODERN GARDENING
Price $3.50

MAINTENANCE OF SHADE AND ORNAMENTAL TREES
by P. P. PIRONE, *Plant Pathologist*
Price $8.00

THE GREEN EARTH
by H. W. RICKETT, *Bibliographer*
Price $3.50

DISEASES AND PESTS OF ORNAMENTAL PLANTS
by B. O. DODGE *and* H. W. RICKETT
Price $6.00

The above books and any books relating to botany, gardening, and allied subjects may be ordered through . . .

BOOK SERVICE
THE NEW YORK BOTANICAL GARDEN
Bronx Park, New York 58, N. Y.

done short of cutting it down.

To sum up this "Sunset" book contains valuable information and illustrations. However, I should not recommend it as a single publication on lawn care for the Northeast. As a supplemental reference to locally written bulletins and articles on lawns, it is certainly worthwhile and its price is more than reasonable.

ROBERT J. KESSLER
Floriculture Dept.
N. Y. State Agr. & Tech. Inst.
Alfred, N. Y.

INDOOR PLANTS AND HOW TO GROW THEM. A. Bertrand. 92 pages, illustrated; translated from the French by Vera Higgins. Philosophical Library, New York. 1955. (Printed in Great Britain.) $4.75

Indoor Plants and How to Grow Them by A. Bertrand is a delightful little book on house plants, written originally in French and translated by Vera Higgins.

Both color and black and white have been used to illustrate this book, and the quality of both mediums is outstandingly beautiful. The book is not complete—what book is? But I do think it has achieved its purpose in helping the amateur and housewife care for their plants.

The plants are listed alphabetically with a brief description and hints on the care and culture in the home. One wonders why *Sedum Sieboldii* was included as a house plant. I am afraid it would be rather unhappy in our warm houses, unless it were possible to grow it on a cool porch.

For most part the selection of plants is good. The statement that "the *Primulas* are amongst the prettiest of room plants and best known" hardly applies in the United States. The cultural suggestions on the whole are good and could well be applied in this country. The one exception regarding lily-of-the-valley is not important. Whenever I have purchased forcing pips, printed instructions have usually been furnished and if followed can be depended upon to give good results.

DON RICHARDSON
Orchidridge
West Orange, N. J.

HOW TO MAKE CUT FLOWERS LAST. Victoria R. Kasperski. 191 pages, illustrated, indexed. M. Barrows, New York. 1956. $2.95

This book by Miss Kasperski, who has had long experience in arranging flowers at the Washington Home in Mount Vernon, will be invaluable to the exhibitor, both of arrangements and of specimens for the horticultural section of a flower show.

Plant material varies in structure and lasting qualities, and each variety has its own particular requirements. It is always disappointing to have one's beautiful arrangement lose its freshness in a short time, particularly if it wilts on the day of exhibition. This reviewer has sad recollections of an unfortunate experience in the International Flower Show in New York several years ago, when primroses used in an exhibit drooped their weary heads long before the day was over, in fact, even before the arrangement was judged. This would not have happened, had she had the benefit of Miss Kasperski's advice.

There are instructions as to how and when to gather your precious blossoms, how to cut and condition them for exhibition, with special treatment for almost every known variety; factors are explained that may prolong life, and information as to how long they may be expected to last in good condition. There are special tricks to conditioning tulips, oriental poppies and cyclamen; even vegetables sometimes require special "grooming!"

Notes are given on the values and dangers of refrigeration; temperature and humidity of room atmosphere, and suggestions as to the best containers for conditioning plant material, i.e., glass, pottery, wood, etc. Another valuable hint is the method of treating branches as used in Japanese arrangements; even how to wedge branches in the approved Japanese manner.

Instructions for drying flowers are included with a list of the most suitable plants; also for making pot-pourri, so beloved by our grandmothers.

You may seek to know how to keep a Christmas tree fresh, or to preserve your precious corsage—all will be found between the covers of this valuable little volume.

RUTH E. WILSON
South Orange, N. J.

THE NATURAL HISTORY OF A YARD. Leonard Dubkin. 208 pages, illustrations by Carl Kock. Henry Regnery Co., Chicago, Ill. 1955. $3.50

The yard here chronicled is a semicircle of grass and shrubs in front of an apartment house in Chicago. In this unlikely arena the author found such a "world of enchantment" that he was moved to record his observations, hoping to encourage other city dwellers to similar adventures.

The account is most effective when it describes animal, bird, and insect life, least convincing when it digresses to personal opinions and conclusions for which the data seem insufficient. Division of the material by years impedes the continuity in some instances, as does the variation in style from colloquial to academic. These faults will not prevent new students of nature from enjoying Mr. Dubkin's search for the ants' supermarket or his discovery of the pigeons' macabre nursery. Experienced observers should wait for the better books he will undoubtedly write.

BEATRICE KYDD
Brooklyn, N. Y.

WHAT'S NEW IN GARDENING. P. P. Pirone. 254 pages, illustrated (drawings by Reisie Lonette); indexed. Hanover House, Garden City, N. Y. 1956. $3.50

This accurately named book, the author says, is the result of five months of writing and five years of gathering material for it. He ignores, I think, many more years of research, of growing healthy plants and ministering to sick ones, and of answering countless questions asked by other, perplexed gardeners. Nor does he mention (naturally he wouldn't), as I am glad to, his skill and success in describing with dispassionate frankness and fairness the great variety of materials, methods, and machines that comprise *What's New in Gardening.*

The book is of special interest to me for several reasons. First, I have known "Pat" Pirone for many years and the good work of an old friend is always interesting. Secondly, in editing last year a new edition of a garden book, I attempted in a supplementary chapter to survey the progress made in gardening during the last twenty years. Thirdly, I stuck my neck out in a recent radio interview by naming what I thought were the "ten outstanding achievements in gardening" over the past fifty years. So I was impressed by the wide range and comprehensive coverage of this book—from the newer plants of various kinds and the Plant Patent Act (one of my "nominees," by the way), propagation practices, soil and lawn management, chemicals and other substances as used in soil improvement, plant protection, etc., down to "garden gadgets."

Unlike the great majority of garden books (and other writings in garden magazines and other places), *What's New in Gardening* makes no bones about naming products and their makers or sources—for which, congratulations to both author and publisher. Of course, because of its timeliness and the fact that it deals with specific things, this book, like any current review, directory, or work of that nature, was destined to be "out of date" in some respects the day after publication. The name of "new things" is not only legion, but also continuing and endless. But this does not mean that it will not be applicable, valuable, and of great help to gardeners for some time to come.

In fact, *What's New in Gardening* is probably one of the best protections now available against the unfortunate trend toward exaggerated promotional claims and misrepresentative sales practices that comprise one of the difficulties that modern gardening and gardeners have to contend with. It would be a good thing all around, I think, if all beginning gardeners (and a lot of more experienced but all too credu-

(Continued on page 129)

Remember **BOBBINK & ATKINS** *for the*

NEWEST of the All-American Roses
OLDEST of the charming historical Roses

See them in The New York Botanical Rose Garden

Our complete catalogue, "Garden Gems," not only illustrates and describes ROSES but also hundreds of choice HARDY PERENNIALS for all-season blooms; also the unusual EVERGREEN TREES and SHRUBS, AZALEAS, RHODODENDRONS, PIERIS, PYRACANTHAS, and a host of other rare plants not available elsewhere.

Please remit 35c for this valuable catalogue and FREE 50c certificate for which, when returned with your order for $5.00 or more, will be honored as cash in the U. S. A.

BOBBINK & ATKINS
Quality Plants for Your Garden
401 Paterson Ave., East Rutherford, N. J.

VISITORS INVITED to our GARDEN CENTER and NURSERY MARKET

NEWS, NOTES and COMMENTS

Annual Meeting of The New York Botanical Garden. A very representative gathering of members of the corporation of The New York Botanical Garden assembled at the Lorillard Snuff Mill on May 17 for the annual meeting. Charles B. Harding, President, presided. Re-elected as members of the Board of Managers of the class 1956-1959 were Mrs. James Cox Brady, Leonard J. Buck, Mrs. Charles Burlingham, Mrs. Elon Huntington Hooker, Gilbert H. Montague, Frederick S. Mosley, Jr., Mrs. Hermann G. Place, Mrs. John L. Senior, Chauncey Stillman and Oakleigh L. Thorne. Elected as members of the corporation were Mrs. Detlev W. Bronk, Mrs. Elmer D. Merrill, Mrs. Clifford D. Mallory, Miss Elinor Merrell, Mrs. Clarence G. Michalis, and W. Earle Andrews.

On behalf of the Garden Club of America, Mrs. Hermann G. Place and Mrs. Harry T. Peters presented the Sarah Gildersleeve Fife Award for 1956 to Miss Elizabeth Cornelia Hall, Librarian of The New York Botanical Garden. The citation which accompanied the award follows:

"The Sarah Gildersleeve Fife Award for 1956 goes to Elizabeth Cornelia Hall, Librarian of The New York Botanical Garden . . . The Library of The New York Botanical Garden, over which Miss Hall presides with dignity and efficiency, consists of 62,000 volumes and over one thousand annual subscriptions to periodicals. Miss Hall is a popular lecturer on garden literature to horticultural groups and has staged many exhibits of rare as well as current books. One of the popular innovations in the Library at the Garden, instituted by Miss Hall, is the corner for children's books on nature study. Many hundreds of children have taken advantage of this opportunity and, under Miss Hall's direction, frequently come to the Library to study these books . . . on her own time, Miss Hall always comes to the Library in the evenings when horticultural classes are being held, to make the library available to students during the evening hours. For her work in compiling a bibliography on herbs, she was made an honorary member of the New York Unit of the Herb Society of America.

These outstanding qualifications for this award do not in any way describe her modest and lovely character. She is beloved and respected by all who know her. Her constant help to students and to authors doing research in the Library is phenomenal. The bond between Mrs. Fife and Miss Hall was one of similar interests in the field of horticulture, and there existed between them a warm friendship.

Her influence on current horticultural literature cannot be over-emphasized, and her knowledge of rare books is profound. She has for many years advanced horticulture in the field of literature. It is with great pleasure that the Sarah Gildersleeve Fife Award is presented to Miss Hall."

Three Distinguished Service Awards were presented by The New York Botanical Garden. Miss Hall read the citation accompanying the award to Mrs. Roy Arthur Hunt of Pittsburgh, Pa., Dr. Bassett Maguire the citation to H. R. Kunhardt of Essex, Conn., and Dr. Donald P. Rogers the citation to Dr. Daniel Trembly MacDougal of Carmel, Calif.

Mrs. Hunt has spent many years in collecting her botanical library which is a valuable asset to botanists and scholars not only of this country but of the world, for it comprises the history of botanical art. Her rare books, manuscripts, prints, and drawings have been exhibited at the National Gallery of Art, the Baltimore Museum of Art, the Carnegie Museum in Pittsburgh, the Clements Library and the Metropolitan Museum of Art. In recognition of her devoted efforts in accumulating these rare records of botanical knowledge, of her magnaminity in sharing her treasures, and especially her generosity to the Library of The New York Botanical Garden, the Board of Managers presented the Distinguished Service Award to Mrs. Hunt.

Mr. Kunhardt, who lived in Venezuela for many years, has been a critical collector and photographer of the native orchids of that country. He made extended excursions to the far interior, the last one being an expedition to the Angel Falls in the "Lost World" of Auyan-tepui, of Venezuelan Guayana. These interests led Mr. Kunhardt to sponsor a series of botanical expeditions in Venezuela which were begun in 1948 and still continue. As Chairman of the Expedition Committee of The New York Botanical Garden, he has facilitated the program of tropical field operations under which outstanding achievements in contemporary exploration have been made. In recognition of his contribution, a new genus of plants was named *Kunhardtia*. The Distinguished Service Award was presented to Mr. Kunhardt with the grateful appreciation of The New York Botanical Garden.

Dr. MacDougal, physiologist and ecologist, was the first director of the laboratories of The New York Botanical Garden; he left to make the Desert Laboratory of the Carnegie Institution of Washington his life work. Dr. MacDougal has published many papers and textbooks on the major phases of botany. One of his important monographs, published while at the Garden, is concerned with the influence of light and darkness on plants. In recognition of his qualities as a scientist and for his notable contributions to botanical science and horticulture this meritorious award was presented to Dr. MacDougal.

Mrs. John D. Beals, Jr., Chairman of the Advisory Council, Mrs. James Cox Brady, Chairman of the Volunteer Associates, Mr. Harding, and Dr. William J. Robbins, Director, presented their annual reports. The annual report will be mailed to members of the Garden.

Mrs. Brady, who is retiring as chairman of the Volunteer Associates, presented Mrs. Fergus Reid, Jr., her successor in office.

Arbor Day Exercises at the Garden. Some four hundred and fifty children, selected from schools in Manhattan and the Bronx, gathered on the knoll opposite the magnolia planting on Friday afternoon, April 27, to witness Arbor Day exercises at The New York Botanical Garden. The children, accompanied by their teachers, were kept in good order not only by the teachers but by the guard of service scouts of the Boy Scouts of America—a group of young men whose dignified behavior should receive special commendation.

Dr. William J. Robbins, following the singing of "Star Spangled Banner" by Helen Gonzo, extended greetings to the audience of young people; then Honorable Thomas C. Desmond, State Senator of New York related how he had become interested as a boy in trees and how this interest had continued throughout life, resulting in the planting of many trees around his home in Newburgh, N. Y.

Dr. P. P. Pirone, Plant Pathologist, asked the children if they realized that they would not be present on Arbor Day, if it were not for trees; that they would not be housed and fed and clothed, if it were not for trees and other plants. His remarks were well directed to the youthful audience.

F. L. Parr, Chairman of the Board of Arbor Day Association, presented a framed copy of the Nebraska proclamation, the original Arbor Day proclamation, which was accepted by Mr. Desmond as a member of the Board of Managers of The New York Botanical Garden.

At the conclusion of the program, seedling pin oaks and small house plants were distributed to the children. Three honey locust trees were planted on the grounds of the Garden by Sheldon Katz, Troop 67 representing the Boy Scouts, by Henny Yukas of Troop 1-29 and Eileen Hudes, Troop 1-207, representing the Girl Scouts,

Arbor Day Exercises at
The New York Botanical Garden

and by Anthony Salzano and Edward Esposito of Public School 13, representing the school children.

Guggenheim Fellowship Award to Garden's Director. Dr. William J. Robbins, Director of The New York Botanical Garden and Professor of Botany at Columbia University, has been granted a Guggenheim Fellowship Award 1956 to conduct studies of the production by living organisms of chemical substances which modify growth patterns.

Fellowship awards totaling more than $1,100,000 have been granted to two hundred and seventy-five scholars and artists by the John Simon Guggenheim Memorial Foundation, the largest number of fellowships and the largest total of grants ever announced by the Foundation in any one year. The Foundation was established in 1925 by the late United States Senator from Colorado, Simon Guggenheim, and Mrs. Guggenheim in memory of their son, John Simon Guggenheim, who died in 1922. The fellowships are granted to men and women without distinction for race, color, or creed, who have demonstrated the highest capacity for original scholarly research and artistic creation — citizens of all the American republics, of the republic of the Philippines, of Canada, and of the British Caribbean area. Dr. Robbins received his award under the division of botany.

Director of The New York Botanical Garden elected President of the American Philosophical Society. At the annual meeting of The American Philosophical Society, held in Philadelphia, April 19, 1956, Dr. William J. Robbins was elected President. In being so honored. Dr. Robbins reflects honor upon The New York Botanical Garden of which he is Director.

The American Philosophical Society, the oldest and one of the most distinguished learned societies in America, was started by Benjamin Franklin in 1743 in "A Proposal for Promoting Useful Knowledge Among the British Plantations in America." Fifteen signers of the Declaration of Independence and thirteen Presidents of the United States have been members of the society. Dr. Robbins follows in office such notable Americans as Benjamin Franklin, Thomas Jefferson, and Owen J. Roberts, Justice of the Supreme Court of the United States. Mr. Roberts was President of the American Philosophical Society at the time of his death on May 17, 1955.

With a library of more than 100,000 volumes, 250,000 manuscripts and innumerable maps and pamphlets; with very substantial income from restricted and unrestricted endowments (the largest of which is the Penrose Endowment), the American Philosophical Society is able to promote research and improve the knowledge of mathematical and physical sciences, geological and biological sciences, social sciences, and humanities far beyond anything its founder may have envisioned over two hundred years ago.

One of its four publications, the Transactions of the American Philosophical Society (now largely used for the publication of large monographs), is the oldest scientific periodical in America, with a continuous history since 1769. The Proceedings of the Society were started in 1838; one volume is now issued annually. The Memoirs, initiated in 1935, are published from time to time—for scholarly books in all fields of learning. The Year Book was established in 1937, and reading the Year Book 1955 has been an illuminating experience.

Garden Club of America Awards. At its forty-third annual meeting held in Colorado Springs, Colorado, on April 18, 19, 20, 1956, the Garden Club of America honored nine leaders in conservation, botany, and horticulture with coveted awards.

Mrs. Hermann G. Place of Millbrook, N. Y., received the Medal of Achievement for her dedication to the best interests of the Garden Club of America. Mrs. Place, a former president of the Garden Club of America, represents that organization on the National Arboretum Advisory Council; is the New York representative of the National Quest for Historic Preservation; is a member of the Board of Managers and of the Advisory Council of The New York Botanical Garden.

The Medal of Honor was awarded to Henry Francis du Pont ot Winterthur, Delaware. Since boyhood, Mr. du Pont has been interested in gardening, and this interest culminated in the great achievement of his beautiful estate, one of the world's great gardens with its profusion of rhododendrons, azaleas, dogwoods, native wild flowers, and collections of iris, peonies, lilies and other plants. Mr. du Pont is a member of the Board of Managers of The New York Botanical Garden.

The Margaret Douglas Medal was awarded to Mrs. Edward H. McKeon of Ruxton, Maryland, for her outstanding contribution to conservation education. For over thirty years, Mrs. McKeon has striven for landscaping the highways on the east coast, especially in Maryland and Florida. Through her efforts, Route AIA, on the east coast of Florida, was designated the "Ocean Trail" and a "Scenic Highway."

Edward Owen Orpet of Santa Barbara, California, was awarded the Florens De Bevoise Medal for his readiness to share his horticultural knowledge and for adding richness to the horticultural field through hybridization. Mr. Orpet achieved fame while living in the East in 1900, when he was the first in this country to exhibit hybrid cattleyas raised from seed. Using agar in bottles was unknown in those days; Mr. Orpet was able to germinate the seeds, after repeated attempts, in osmunda gathered in the nearby Massachusetts woodland. Fourteen of his articles on the subject of developing orchids are included in Bailey's *Standard Encyclopedia of Horticulture.* In his adopted state of California, he has raised and distributed far and wide from his garden many bulbs of the Irid and Amaryllid groups, as well as succulents.

Other awards were: Amy Angell Collier Montague Medal to Mrs. John Evans of Denver, Colo., for her contributions to the City of Denver and State of Colorado, in the promotion of horticulture and forestry; Katharine Thomas Cary Memorial Medal to Mrs. Yoneo Arai of Greenwich, Conn., for teaching and demonstrating the art of flower arrangement for over twenty years; Mrs. Oakleigh Thorne Medal to Mrs. Irving C. Wright of Boston, Mass., for her originality and execution of garden design and especially for her plan for the one hundred and twenty-fifth anniversary exhibition of the Massachusetts Horticultural Society; Francis K. Hutchinson Medal to Sigurd P. Olson of Ely, Minn., in recognition of his life-long work in national conservation. His lectures and writings have contributed materially to the understanding of the need for larger wilderness recreational facilities.

The Elmer D. Merrill Fund. Dr. Elmer D. Merrill, Director-in-Chief of The New York Botanical Garden (1930-1935), who died February 25, 1956, left his medals, diplomas, and library to The New York Botanical Garden, with the request that items in his library which duplicated those already in the Garden's library be sold and the proceeds be used to establish the Elmer D. Merrill Fund. He stipulated that the income from this fund be applied to official publications from the Garden or for

Louis P. Politi, Head Gardener, supervises the replacement planting of roses in the Rose Garden of The New York Botanical Garden. The seven hundred and fifty plants, presented by Bobbink & Atkins of Rutherford, N. J., include the old-fashioned 'Henri Martin,' 'Mousseux Ancien,' 'Waldtrant Nielsen,' 'Salet,' and 'Maiden's Blush' and such modern varieties as 'Queen Elizabeth,' 'Jiminy Cricket,' 'Mojave,' and 'Helen Traubel.'

Left: Mrs. William J. Robbins, wife of the Director of The New York Botanical Garden, holds an umbrella over the wife of one of the delegates to the U.N. as they approach the entrance to the Snuff Mill. Among the countries represented at the Garden's party for the U.N. on May 23, 1956, were Belgium, Brazil, Canada, Chile, Cuba, Denmark, Ecuador, Egypt, Ethiopia, France, Guatemala, Haiti, Iran, Irak, Pakistan, Panama, Philippines, Peru, Thailand, Turkey, United Kingdom and the United States. Mrs. Franklin D. Roosevelt, Chairman, and members of the United Nations Hospitality Committee, Mrs. Harold Irving Pratt, Chairman of the City Relations Committee of The New York Botanical Garden, and Mrs. Fergus Reid, Jr., Chairman of the Volunteer Associates of The New York Botanical Garden, were among the guests.

Below: Mrs. Milton A. Hescock of Mamaroneck, New York, well-known exhibitor and teacher of the art of arranging flowers, has the close attention of members of the U.N. party in the Assembly Room of the Snuff Mill, as she demonstrates contemporary flower arrangements.

a medal to be awarded to that individual within the entire field of botany, irrespective of race, creed, or nationality who was considered worthy of such an award.

An appeal for contributions to the Elmer D. Merrill Fund has been authorized by the Board of Managers of The New York Botanical Garden.

In April 1956, the library of The New York Botanical Garden received additional periodicals, reprints and books from Dr. Merrill's library, and the honorary degrees, citations, and fellowships conferred upon him by Harvard University, Maine University, Yale University, University of California, *Societas Linnaeana Lundinensis, Societas Regia Edinensis, Deutsche Botanische Gesellschaft, Institut Genevois,* and others. Also a beautiful red silk flag with Chinese characters embroidered in gold; on the right the name of Elmer D. Merrill; on the left the name of the donor, Chiao Chi-yuen and the name of the artist, Kao Wen; in the center, "Long Life and Happiness to You. This little gift expresses only a limited fraction of your untiring inspiration to botanical workers here. Nanking, China."

Mrs. Elon Huntington Hooker died at the age of eighty-four on June 6, 1956, after a three-months illness. She became a member of The New York Botanical Garden in April 1916 and had been a member of the Board of Managers and of the Advisory Council since 1931 and of the Corporation since 1933. Mrs. Hooker served as chairman of the Advisory Council from 1933-1940 and as first vice-chairman from 1940-1948; she was made an honorary member of the Council in October 1954. Mrs. Hooker, who was named a benefactor of The New York Botanical Garden in August 1946, gave the shelter house in the Rose Garden which was dedicated in 1951.

Mrs. Hooker was daughter of Dexter Mason Ferry, founder of D. M. Ferry & Co., now a part of Ferry-Morse Seed Co. She is survived by her brother Dexter M. Ferry, Jr., a sister, four daughters, and ten grandchildren.

GARDEN TOUR (from page 123)

In his comments on some of the plant material, Mr. Everett called attention to a remarkable old specimen of yellow wood *(Cladrastis lutea)* whose trunk was severely damaged and decayed. The tree has put forth roots from its branches seven or eight feet above ground; these have reached the earth and anchored themselves securely. Such a phenomenon is rarely seen in temperate regions, but is common in moist tropical areas. Mr. Everett considers the yellow wood one of the finest native trees of eastern North America, forming a splendid specimen when given ample room to develop. Its fragrant, creamy white flowers, resembling wisteria, are borne in June.

BOOK REVIEWS (from page 126)

lous ones) were to make *What's New in Gardening* part of their required reading.

E. L. D. SEYMOUR
Garden Editor Emeritus
The American Home

DISCOVERING NATURE THE YEAR ROUND. Anne Marie Jauss. 61 pages, illustrated by the author; indexed. Aladdin Books, E. P. Dutton, New York. 1955. $2.50

Discovering Nature the Year Round is a little book of sixty-one pages. It is written as a nature calendar to help the amateur nature lover know when to look for the various changes that occur throughout the year. The book is divided into twelve sections, one for each month. Each section, in turn, tells what may be found in the woods and fields in the line of plant life, animals, birds and insects. Some months also have items on frogs, snakes, fish and turtles.

Plant life throughout the twelve months describes what evergreens may be found in the snow, differences in tree barks, mosses, ferns, flowering plants, mushrooms and berries. Animal life covers hibernation habits, types of homes and tracks of the common woodland animals. In telling of birds, the author points out what birds may

From the library of Dr. Elmer D. Merrill, bequeathed to the Library of The New York Botanical Garden. See page 128

be seen during each month and when to look for migration. Insects are mentioned according to their appearance in various stages of life and it is surprising how many insects can be found during each month.

This book is filled with beautiful drawings by the author. They depict so many little details in the world of nature, simple things that are too often overlooked such as a morel mushroom, a vireo's nest, a skunk in the snow or a cricket among wild strawberries.

Discovering Nature the Year Round is a book not only for those about to delve into the joys of nature. It is also a delightful reminder for those city dwellers who were brought up in the country—a reminder that all the lovely happenings they used to watch as children are still going on month by month as Nature fills her round of life.

ELIZABETH A. PULLAR
New York, N. Y.

GROUND COVER PLANTS. Donald Wyman. 175 pages, illustrated, indexed. Macmillan, New York. 1956. $4.75

Because of the increase of casual outdoor living, many difficulties in growing good lawns, and the use of a variety of planting levels in contemporary landscaping, the popularity of ground covers has surged over America in the last few years.

Undoubtedly, Dr. Wyman had these ideas in mind when he wrote this comprehensive book entitled *Ground Cover Plants*. It is written in the precise and thorough manner of his former books. It is packed with accurate information. The introductory chapters emphasize the use of ground covers. This is followed by alphabetical lists of plants that are recommended, and descriptions are provided for flowers, fruit, foliage, habitat, and method of propagation. These descriptions are enhanced by several plates showing the detail of specimen plants, as well as the uses of the ground covers in effective settings.

The book is prepared so that it will be useful to nurserymen, landscape architects, botanists, ornamental horticulturists, and particularly all amateurs.

Few American horticulturists could recommend such an array of useful ground covers as a result of their own personal experience.

DR. DONALD P. WATSON
Professor
Michigan State University

THE GENUS PHLOX. Morris Arboretum Monographs III. Edgar T. Wherry. 174 pages, indexed, illustrated. Associates of the Morris Arboretum, Philadelphia, Pa. 1955. $4

The present monograph is the culmination of Dr. Wherry's thirty years of study of *Phlox*, and represents his magnum opus. It includes keys, full descriptions, full synonymy with literature-citations, numerous drawings and photographs, explanatory comments, and stippled distribution-maps. The only specimens cited are the types of recognized taxa, and it should be noted that the dots on the maps do not represent individual collections or stations. Sixty-seven species (three of them newly described) are distributed among three sections and eighteen subsections. Many of the species are considered to consist of several subspecies each, and a total of one hundred and twenty-three ultimate taxa (subspecies and undivided species) is recognized. Most of these have been studied in the field as well as in the herbarium by Dr. Wherry, very often at the type localities as well as elsewhere.

The keys to the taxa of each subsection are inserted separately in the text, are of non-indented form, and follow the novel principle of referring to numbered ultimate taxa without regard to whether these are species or subspecies. Each ultimate taxon is fully treated according to a uniform plan, but the species which are considered to consist of two or more subspecies are not provided with a separate specific description or other treatment.

The depressed phloxes, constituting the section Microphlox, form a particularly difficult taxonomic complex, and other botanists may have trouble with the keys in this section. Having recently attempted to treat some of these same species for a flora, the reviewer doubts that a wholly satisfactory key could be provided for them in any case, and an attempt to expand the specific limits beyond those seen by Dr. Wherry tends to confuse rather than clarify the taxonomy of this group.

Within the framework of his taxonomic philosophy, Dr. Wherry has presented a clear and consistent treatment, based largely on classical taxonomic methods. A notable feature of his philosophy, which he has expressed in personal conversation as well as in print, is a desire to provide nomenclatural recognition for morphologic variation, coupled with a reluctance to reduce any published name to outright synonymy. Those botanists who think of subspecies (or varieties) as self-perpetuating natural populations which are geographically or ecologically marked within the species as well as being morphologically recognizable, have often found that Dr. Wherry's subspecies do not meet their criteria. The present work will be no exception in that regard, although a number of names have been disposed of as representing morphologic variants which are not accorded formal taxonomic status.

Dr. Wherry's species in *Phlox* are more likely to meet with general acceptance than his subspecies. Closer attention to the geographic factor might have sharpened the specific lines in some instances, but so far as the reviewer's experience goes, the species recognized in this monograph generally *do* represent self-perpetuating, morphologically recognizable populations with geographic-ecologic coherence, and the reviewer is convinced that most of these would be recognized as species by any other monographer of the genus.

ARTHUR CRONQUIST

Mrs. E. I. Donohoe of Mill Race Farm, High Bridge, N. J., stands before her entry in the class "This is My Garden." This display, representative of the plant material in her garden, won the tricolor in the horticultural classes on the opening day of the Eighth Garden State Flower Show of the Garden Club of New Jersey, May 15, 16, 17, 1956, held in the club's headquarters in Orange, N. J. The severely cold spring curtailed horticultural exhibits, but narcissi and tulips were good, so were the flowering shrubs.
The flower arrangements were superior; the luncheon, dinner, and tea tables imaginative and charming; and the "Junior" exhibits demonstrated the worth whileness of arousing interest in growing things and developing civic pride at an early age.

AMATEUR BEEKEEPING. Edward Lloyd Sechrist. 148 pages, illustrated by Frank Norris Todd; indexed. Devin-Adair Co., New York. 1955. $3.50

Amateur Beekeeping is a book for everyone who is interested in or wishes to start beekeeping. Mr. Sechrist analyzes everything from beginning to end. Anyone studying his book will have correct information available here. He carefully gives advice about the hive and its parts, as well as avoiding unnecessary expenses.

The kinds of bees, queen rearing and the importance of drones is told wonderfully. By careful study, one learns to handle bees carefully in order to avoid stings. We are told how normal brood should be; their diseases, treatment and prevention (pointing out to us the thoroughness with which Mr. Sechrist studied bees). Of course, after reading *Amateur Beekeeping,* swarming and catching a swarm would be no trouble to anyone.

Finally comes the harvesting of the honey. Some will extract honey; others with one or two hives, beautiful comb honey. Mr. Sechrist tells us where to store honey to prevent granulation; old combs and cappings in a solar wax melter (a box in right angles to the sun, with glass on top will do it, and anyone can make it).

So truthfully he says, "Man is the bees' worst enemy," some robbing the bees of their winter supply (bees kept during winter should have an adequate store of food). Their other enemies are the skunk and bee martin or kingbird.

Wintering of bees is easy if done right. *Amateur Beekeeping* by Mr. Sechrist is outstanding and can be recommended for everyone who wants to start with bees.

WILHELM NOLTE
Bronx, New York

BIOLOGY OF ROOT-INFECTING FUNGI. S. D. Garrett. 293 pages, bibliography, index. Cambridge University Press, New York. 1956. $5.50

One of the least understood and most difficult-to-study phases of plant pathology is diseases of roots. Yet Dr. Garrett, Director of the sub-department of Mycology at Cambridge University, gives a most enlightening presentation of this subject. The book is not merely a compilation of other workers. It includes many pages of the author's own experiences and observations made over the past twenty-five years. Unlike most European scientists, Dr. Garrett is thoroughly acquainted with the American and Canadian literature on the subject and consequently refers to these frequently. Although written in an interesting style, this book, however, is a bit too technical for amateur gardeners. It should be used widely and to good advantage by all students and experts on soils, as well as by all plant pathologists and related professions.

P. P. PIRONE

The article in the series "From Mud to Marigolds—Know How to Do It" in which A. C. Pfander describes how the business couple can enjoy a garden of maximum comfort and usability and simplest maintenance will appear in the September-October number of The Garden Journal.

The Corporation of The New York Botanical Garden

The New York Botanical Garden was incorporated by a special act of the Legislature of the State of New York in 1891. The Act of Incorporation provides, among other things, for a self-perpetuating body of incorporators, who meet annually to elect members of the Board of Managers. They also elect new members of their own body, the present roster of which is given below.

The Advisory council consists of 12 or more women who are elected by the Board. By custom, they are also elected to the Corporation. Officers are: Mrs. John D. Beals, Jr., Chairman; Mrs. John E. Parsons, First Vice-Chairman; Mrs. John E. Lockwood, Second Vice-Chairman; Mrs. Volney F. Righter, Recording Secretary; Mrs. Antonie P. Voislawsky, Corresponding Secretary; and Mrs. Richard de Wolfe Brixey, Treasurer.

Arthur M. Anderson
Mrs. Arthur M. Anderson
W. Earle Andrews
Mrs. Montgomery B. Angell
George Arents, Jr.
Mrs. Elliott Averett
Stephen Baker
Sherman Baldwin
Mrs. John Holme Ballantine
Mrs. William Felton Barrett
Howard Bayne
Mrs. John D. Beals, Jr.
Edwin De T. Bechtel
Mrs. S. Laurence Bodine
Mrs. Neville J. Booker
Mrs. James Cox Brady
George P. Brett
Mrs. Richard de Wolfe Brixey
Mrs. Detlev W. Bronk
Leonard J. Buck
Mrs. Charles Burlingham
Charles Burlingham
Mrs. Joseph Campbell
Miss Mabel Choate
Mrs. LeRoy Clark
Dr. Harold H. Clum
Mrs. Henry S. Fenimore Cooper
Mrs. Erastus Corning II
Mrs. William Redmond Cross
C. Suydam Cutting
Mrs. Thomas M. Debevoise
Mrs. Sidney G. de Kay
Edward C. Delafield
Mrs. Lyman Delano
Hon. Thomas C. Desmond
Julian F. Detmer
Mrs. Charles D. Dickey
Mrs. Charles Doscher
Mrs. Percy L. Douglas
Mrs. Walter Douglas
Henry F. du Pont
Mrs. William B. Eddison
Mrs. Robert B. English
Mrs. Moses W. Faitoute
Lynn Farnol
Mrs. Reginald Fincke
Dr. John M. Fogg, Jr.
Mrs. Mortimer J. Fox
Childs Frick
Mrs. John A. Gade
Mrs. John W. Galbreath
Berkeley Gaynor
Mrs. John Gerdes
Dr. H. A. Gleason
Mrs. Frederick A. Godley
Mrs. L. Whittington Gorham
Mrs. Raymond M. Gunnison
Mrs. Henry B. Guthrie
Mrs. Sherman P. Haight
Charles B. Harding
Mrs. Montgomery Hare
Mrs. Clement S. Houghton
Mrs. Roy A. Hunt
William E. Hutton
Mrs. J. Horton Ijams
Mrs. Edwin C. Jameson
Mrs. Alvin R. Jennings
Mrs. Walter Jennings
Mrs. William Kemble
Mrs. Francis K. Kernan
Dr. Charles G. King
Mrs. Warren Kinney
Mrs. Grayson Kirk
Mrs. Lee Krauss
H. R. Kunhardt
Dr. Louis O. Kunkel
Mrs. Blake L. Lawrence
Mrs. Barent Lefferts
Clarence McK. Lewis
Mrs. Madison H. Lewis
Mrs. John E. Lockwood
Mrs. William A. Lockwood
Mrs. Robert A. Lovett
Mrs. Ethelbert Ide Low
Dr. D. T. MacDougal
Mrs. James C. Mackenzie
Mrs. James W. Maitland
Mrs. Peter Malevsky-Malevitch
Mrs. Clifford D. Mallory
Mrs. Howard W. Maxwell, Jr.
Miss Mildred McCormick
Louis E. McFadden
Rev. Fr. L. J. McGinley, S.J.
Mrs. Richard S. Meredith
Miss Elinor Merrell
Mrs. Elmer D. Merrill
Mrs. Clarence G. Michalis
Roswell Miller, Jr.
S. P. Miller
Mrs. Harold Ruckman Mixsell
H. de la Montagne
Gilbert H. Montague
Barrington Moore
Mrs. William H. Moore
F. Cleveland Morgan
B. Y. Morrison
Frederick S. Moseley, Jr.
Mrs. Augustus G. Paine
Henry Parish II
Mrs. John E. Parsons
Mrs. Wheeler H. Peckham
Mrs. George W. Perkins
Mrs. Harry T. Peters
Mrs. Thomas McC. Peters
Howard Phipps
Mrs. H. Harvey Pike
Mrs. Hermann G. Place
Rutherford Platt
Prof. Frank J. Pokorny
Mrs. Harold I. Pratt
Mrs. Rodney Procter
Mrs. Charles G. Proffitt
Mrs. Grafton H. Pyne
Lady Ramsey
Mrs. S. Bulkley Randolph
Stanley G. Ranger
Johnston L. Redmond
Mrs. Fergus Reid, Jr.
Mrs. Volney F. Righter
Dr. William J. Robbins
Mrs. David Rockefeller
Mrs. Melvin E. Sawin
John M. Schiff
Mrs. Henry F. Schwarz
Mrs. Arthur Hoyt Scott
Mrs. Townsend Scudder
Mrs. John L. Senior
Mrs. Guthrie Shaw
Mrs. Langdon S. Simons
Mrs. Edward G. Sparrow
Mrs. Clarance Stanley
Mrs. Henry Steeger
Edgar B. Stern
Mrs. Eugene W. Stetson
Chauncey Stillman
Mrs. Byron Stookey
Mrs. Donald B. Straus
Nathan Straus
Mrs. Paul Sturtevant
Mrs. Arthur H. Sulzberger
Joseph R. Swan
Mrs. Joseph R. Swan
Mrs. Thomas D. Thacher
Oakleigh L. Thorne
John C. Traphagen
Prof. Sam F. Trelease
Arthur S. Vernay
Mrs. Ernest G. Vietor
Mrs. Antonie P. Voislawsky
Manfred Wahl
R. Gordon Wasson
Mrs. Thomas J. Watson
Mrs. Charles D. Webster
Nelson M. Wells
Mrs. Wallace S. Whittaker
Mrs. Andrew Murray Williams
Mrs. Nelson B. Williams
John C. Wister
Richardson Wright

VASCULAR PLANTS OF THE PACIFIC NORTHWEST, Part 5, Compositae. Arthur Cronquist, et al. 343 pages, illustrated by John H. Rumley. University of Washington Press, Seattle. 1955. $7.50

The appearance of a good flora of an area previously not adequately covered is always most welcome to a taxonomist. Judging from the Part 5 which treats the Composite family, I would say that the *Vascular Plants of the Pacific Northwest* is an excellent flora, and it certainly fills in a gap in the floristic treatments of the United States. The area covered includes all of Washington, the northern half of Oregon, most of Idaho, a large part of Montana, and southern British Columbia. In addition to the usual keys, descriptions, geographical ranges, and flowering periods it also includes complete synonymy and the citation of types for all taxa from the area covered, references to taxonomic treatments of special groups, and chromosome numbers, although complete coverage of known chromosome numbers has not been attained. A very worthwhile feature in the present work is the fine introduction in which the author discusses his concept of genus and species in some detail. The brief discussions of special problems in many of the genera are also most commendable. Several new taxa are proposed in the treatment, and it might have been advisable to have a list of these new names in an appendix.

From the foregoing it is obvious that this flora very adequately satisfies the demands of the professional botanist. However, a second group of potential users, the amateur botanists, will also find the book useful. Every species is illustrated. The drawings are well done and have a good pressed look which facilitates identification from herbarium material. In addition to the customary key to the tribes of the Compositae, there is a second key which goes directly to genus which should make keying easier for the non-professional. The choices in all the keys are clearly numbered which saves time for all. The arrangement of genera alphabetically instead of by the more customary "natural" arrangement has much to recommend it, although it offers serious disadvantages if one can't key directly to a genus and has to search through descriptions of related genera to find his plant.

The appearance of the last volume in advance of the others is probably due in a large measure to the energies of Arthur Cronquist and his devoted interest in the Compositae.

CHARLES B. HEISER, JR.
Indiana University

EMBRYOGENESIS IN PLANTS. C. W. Wardlaw. 381 pages, illustrated, indexed. John Wiley, New York. 1955. (Printed in Great Britain) $7

The current enthusiasm for "morphogenesis" is perhaps in part the witchery of a new word, a word which suggests that we are on the threshold of great new discoveries. Probably we are; but so far the experimental treatment of growing apices has yielded no very sure conclusions. One should read such work together with Katherine Esau's finely critical review (Biol. Rev. 29:47-86. *pl. 1*) of vascular differentiation.

I approach "embryogenesis" therefore with some suspicion: how does it differ from what we have hitherto called "embryology"? In Professor Wardlaw's book there seems to be a distinction even though he does not state it. "Embryology" apparently refers to purely descriptive studies of the development of embryos; "embryogenesis" implies a search for the factors which direct this development. If this is correct, then the book belies its title: the bulk of it is concerned with embryology.

In the author's words, the scope is "(i) to review the facts of embryogenesis in all classes of plants; (ii) to consider to what extent the observed development can be referred to genetical, physiological, physical and environmental factors and to spatial relationships; (iii) to inquire how a study of embryos advances our knowledge of morphogenesis; and (iv) to consider what light this study sheds on the problems of phylogeny, parallel and convergent evolution." A vast program! And since (i) is in fact a general embryology of plants, this alone is a tremendous task, ably discharged, with a wealth of useful illustrations, in 13 of the 16 chapters.

And in this, it seems to me, is the chief usefulness of the book. Embryogenetic concepts and speculations are scattered—in a somewhat repetitious way — throughout its pages, but provide little that is solid and satisfying, even in the way of theory. We learn that a heterogeneous distribution of metabolites in the zygote accounts for the polarity of the embryo; but in spite of the statement that this is "irreversibly determined" in ferns by the first division of the zygote, it is well known that the polarity of the fern embryo is upset by external factors—as the author himself says on other pages. The same applies to the description of angiosperm embryology as specific and regular, each cell playing a certain fixed part in development. Work of Marre and Murneek is badly misrepresented, for these authors did not demonstrate the production of hormones in corn as a result of fertilization; they inferred it. Physiological work on the growth of embryos is reviewed, but the word "growth" is used without mention of whether weight, shape, or differentiation is under discussion, and the bearing of the experiments on morphogenesis is not explained. It is small comfort to be assured, at several points, that the factors in development are many and both genetic and physiological. In short, there seems to be a lack of that organization of this admittedly fragmentary subject which alone could justify a work with this title.

The argument for further study of the subject is reinforced by the statement that, since a small genetic change may conceivably alter the whole course of development, embryology may be a better guide to relationship than adult structure. Which may be true—but the taxonomist will hope it is not.

H. W. RICKETT

ARID ZONE RESEARCH—VI (UNESCO). PLANT ECOLOGY. REVIEWS OF RESEARCH. 377 pages, indexed. Columbia University Press, New York. 1955. (Printed in France.) $8

This book consists of summaries, by selected experts, of the current knowledge of the plant ecology of ten large arid regions of the world, with particular reference to the future use of such areas. Some of the authors have made pointed recommendations. Each report is in English, with a French summary, or vice versa, and is followed by an extensive bibliography. The work was done and published under the sponsorship of UNESCO.

ARTHUR CRONQUIST

LET THERE BE HERBS

Ask any herb gardener what you do with the beautiful blue borage flowers, that hang in clusters over the bristly, three-foot tall plants, looking like a shower of sky-rocket stars in blue and pink with sharp black centers, and she will murmur something about their being used in wine cups. If your experience has not encompassed fox hunts or English garden parties, you may not know what she means and perhaps she doesn't either. Americans have discovered that the cool, slightly cucumber-tasting borage blossoms turn from blue to pink when put in gin drinks, although on the plants some of them start out pink anyway.

Mrs. C. F. Leyel in *Summer Drinks and Winter Cordials* states that the difference between cups and punches is slight. "Cups are usually decorated with sprigs of one of the five cordial flowers—borage, mint, marjoram, pimpernel, or verbena."

Wine cups should be made with wine of such excellence that it can be drunk alone. The cup must be put on ice and not the ice in the cup. Someone has suggested that the old-fashioned mustache cups would be good servers for drinks "on the rocks" to prevent the clink of ice against the teeth. A cooling tankard of wine flavored with herbs would seem to be a more gracious way of refreshing guests.

CLARET CUP

Put into a bowl a bottle of claret, half a pint of cold water, a tablespoonful of icing sugar, a teaspoonful of finely powdered and mixed cloves, cinnamon and allspice. Add the thin rind of half a lemon and a sprig of borage. Chill.

CIDER CUP

Mix a large bottle of cider with a bottle of soda water, and leave it on ice. Then add one liqueur glass of brandy, a dessertspoonful of granulated sugar, some grated lemon rind, and a sprig of lemon verbena.

RHUBARB AND RASPBERRY CUP

Cut up a pound of red rhubarb and boil it in a quart of water for twenty minutes; then strain it and add four ounces of sugar, two tablespoons of raspberry juice, a little red coloring if needed, and serve with grated nutmeg and crushed borage leaves. This will protect the children's teeth against the ravages of summer soda pops. Tests at Cornell University have shown that rhubarb puts a protective coating on tooth enamel.

ENGLISH CIDER BOWL

Mix together half a pint of cold tea (made from green tea), a quarter of a pound of sugar, a quart of sweet cider, and a pint of ginger ale. Decorate with two slices of cucumber, three sprays of golden-edged lemon thyme or French thyme, and one sage leaf.

In making punches, it is better to use tea in place of water. It is essential that all ingredients should be thoroughly mixed.

FRESH MINT PUNCH

Crush twelve sprigs of spearmint; squeeze the juice of six oranges and three lemons over them, and add three quarters of a cup of white sugar. Stir well. Then put a lump of ice in the punch bowl and pour the mixture over it; add a pint of cider or clear apple juice, one and one half quarts of ginger ale, and green coloring to make it a beautiful color.

GERTRUDE B. FOSTER

DAHLIAS (from page 110)

built eighteen years ago. The top is reinforced cheesecloth, which must be replaced every year. The posts are sunk in concrete, and so I have a permanent structure, except for the top.

The cloth and screen will not keep out all insects, such as red spider or leaf minor, but grasshoppers, which can injure a plant very badly, are definitely kept out.

As far as spraying regularly, there is not much difference between the cloth house and plants grown in the open. I spray without fail once a week, using a combination of "Vaportone" one week and "Aramite" the alternate week, with a handful of DDT and chlordane thrown in the mixture.

A cloth house can be any size—I have seen some that hold twenty-five to thirty plants. Formerly the Show Committee had a separate class for dahlias grown under cloth, but there has been a change the past few years to cloth house, professional, and commercial in one class.

Growing dahlias under cloth is a lot of fun and great satisfaction, and I heartily recommend the erection of a small cloth house so that one can see for himself how very much better the results will be.

CALLAWAY GARDENS (from page 119)

plants, are used in mass effect. Colorful annuals are also used extensively.

A three-thousand foot grass airstrip is located just west of Robin Lake. Tiedown, refueling services, and transportation to any or all facilities of the Gardens are available to pilots and families.

Outside and south of the Gardens, on top of Pine Mountain, is the Garden's country store, a "must" for all visitors to the Gardens, featuring homemade and home-grown products, the work of local artists, and imported delicacies from all over the world.

Another facility for vacationers has been accomplished for, by July 1, 1956, a fifty-unit Gardens motel will be open to the public. The motel has a panoramic view of Mountain Creek Lake.

The Gardens are open the year round. An all-out effort is being made to have, within the Gardens, some beauty and recreational activity of interest to all available now, with the expectation that the beauty and the educational value of the Gardens will increase with age.

Are* YOU *Enjoying

The Privileges of Membership

***in* THE NEW YORK BOTANICAL GARDEN?**

These Privileges Include:

- Reduced rates for study courses, lectures, tours and other activities for which the Garden charges fees.
- Subscription to The Garden Journal — every member of your family will enjoy reading this bimonthly magazine—and Addisonia, published irregularly.
- Share in the annual plant distribution.
- Discounts on the purchase of books, bulbs and plants.
- Admission to Members' Day Programs and to previews of special events.
- Personal conferences and identification of plant material.
- Use of the Library and, under staff guidance, the Herbarium.
- Free rides on the "Floral Flyer" (tractor train), and free parking on weekends and holidays.

CLASSES OF MEMBERSHIP ARE:

Annual Member	*annual fee*	$ 10.00
Life Member	*single contribution*	250.00
CONTRIBUTING MEMBERS:		
Sustaining Member	*annual fee*	25.00
Fellowship Member	*annual fee*	100.00
Fellow for Life	*single contribution*	1,000.00
Patron	*single contribution*	5,000.00
Benefactor	*single contribution*	25,000.00
Garden Club Affiliate	*annual fee*	35.00

Why Not Join Now?

•

THE NEW YORK BOTANICAL GARDEN

BRONX PARK

New York 58 New York

If you are a member, why not interest a friend in joining The New York Botanical Garden?

Wayside Gardens

Wayside's bulbs are the world's finest .....be one of the first to grow GOLDEN YELLOW REGALE LILY

Tulipa Turkestanica

New REGALE LILY, *Royal Gold*. First yellow Regale Lily ever offered. *Royal Gold* is truly a horticultural triumph. Large, exquisite flower heads of sparkling gold glisten with a lustrous sheen seldom seen in lilies. Very hardy and easy-to-grow, this spectacular new golden lily possesses all the majestic beauty and sterling qualities of the beloved Regal Lily.

6 TO 7 INCH BULBS.....EACH $2.25, THREE $6.00, DOZ. $21.00

Royal Gold

Dazzling New GOLDEN REGALE LILY

TULIP SPECIES

From Asia and Turkey come these rare, many flowered tulip species, rugged ancestors of our garden tulips of today. They have charming, dainty blooms that are frequently accented with brilliant color markings. Many varieties produce 9 to 11 flowers on a single stem. Once planted, they are permanent, coming up year after year without further care.

This Tulip Species has star-shaped white flowers with rich yellow centers.

WAYSIDE GARDENS "1956" TULIP MIXTURES"

Each year, we arrange with Grullemans of Holland to set aside several thousand choice, top size bulbs for this outstanding collection. Popular mixture includes the finest, superior bulbs selected from hundreds of varieties of Cottage, Darwin, Ideal Darwin, Giant Breeder, Multi-flowered, Lily-flowered and Chameleon Tulips in a harmonious blending of colors.

50 TOP SIZE BULBS..$ 6.50	250 TOP SIZE BULBS..$ 28.00
100 TOP SIZE BULBS..$12.00	1000 TOP SIZE BULBS..$100.00

FRAGRANT PINK DAFFODILS

The delicate, fragile beauty and prolific blooming of these glorious, new daffodils will amaze you. Very hardy and easy-to-grow, they double in number each year. Exquisite flowers have radiant, white petals with gently ruffled cups of shell pink, apricot, tangerine-orange and rose.

One each of eight (8) varieties.....$4.00

WEATHER-PROOF DAFFODILS

You have never seen such Daffodils. Virtually indestructible, the giant flowers bloom gaily unharmed by snow, wind, pelting rain or burning sun. All multiply rapidly.

	Dozen
Brookville. Exquisite, heavy, white petals, large pale yellow cup	$3.75
Confuoco. Deep yellow perianth with wide, crested, vivid scarlet crown	5.75
Duke of Windsor. Huge white petaled beauty, flaring yellow crown	4.85
Green Emerald. Flaring lemon-yellow cup, gleaming white petals	3.50
Harvest Moon. Creamy white petals, golden yellow cup edged in reddish orange	5.75
Manco. Frilled cup of deep gold and orange. Large, pale yellow perianth	4.10
Times Square. Flat ruffled cup of fiery orange-red, cream-yellow perianth	5.00
Wodan. Graceful, frilled, yellow crown, canary-yellow perianth	5.00

Collection: 1 each of the above 8 varieties (8).....$4.00

Duke of Windsor

WEATHER-PROOF DAFFODIL

SEND FOR THE WORLD'S FINEST HORTICULTURAL BOOK-CATALOG

*To get your copy, please enclose 50¢, coin or stamps, to cover mailing and handling costs of this heavy book. Wayside's catalog has no equal. Just imagine . . . 130 pages featuring over 1,300 of the world's newest and best roses, shrubs, bulbs and "**Pedigreed**" hardy plants. Catalog contains hundreds of true color illustrations with helpful cultural directions for every item. Don't miss this valuable reference book.*

91 MENTOR AVE.
MENTOR, OHIO

Wayside Gardens